

The Mining Journal

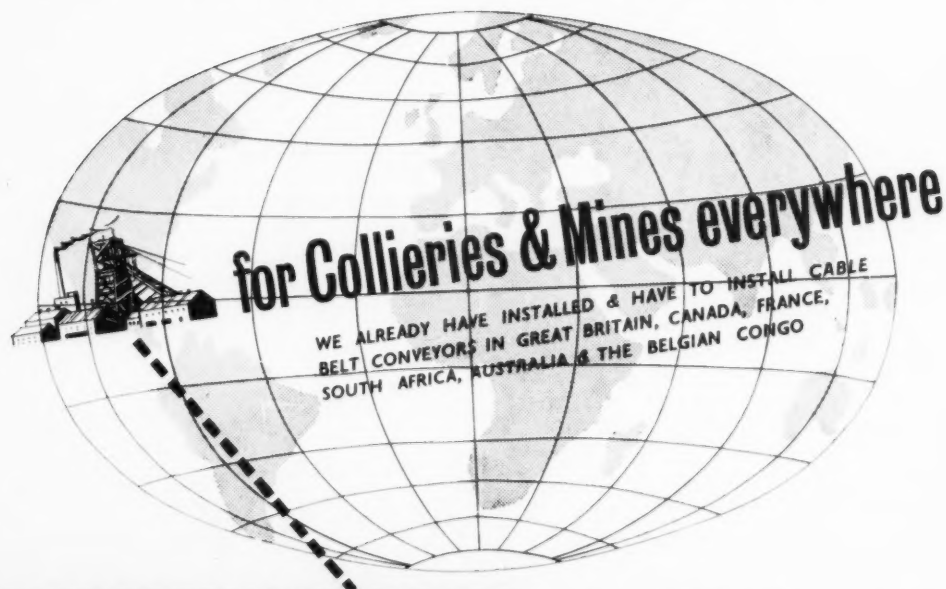
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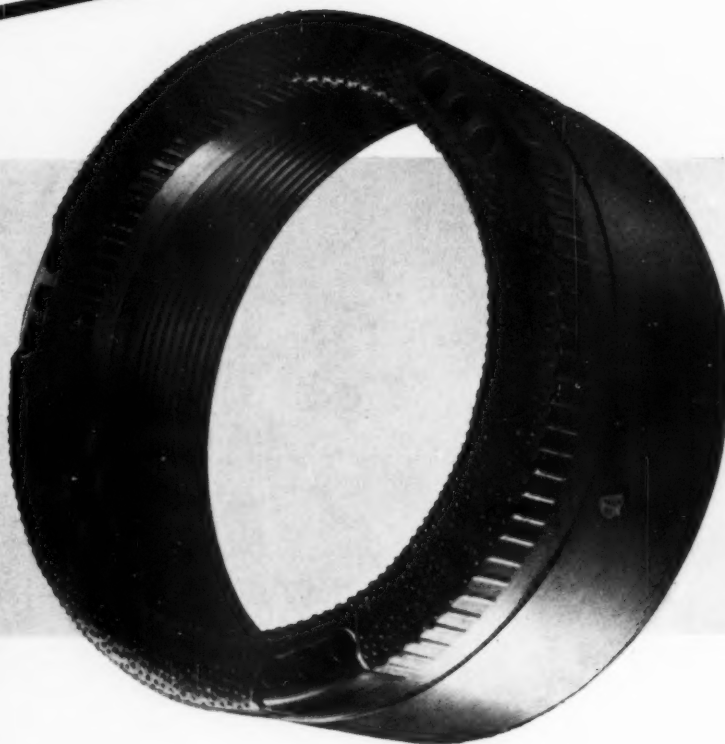
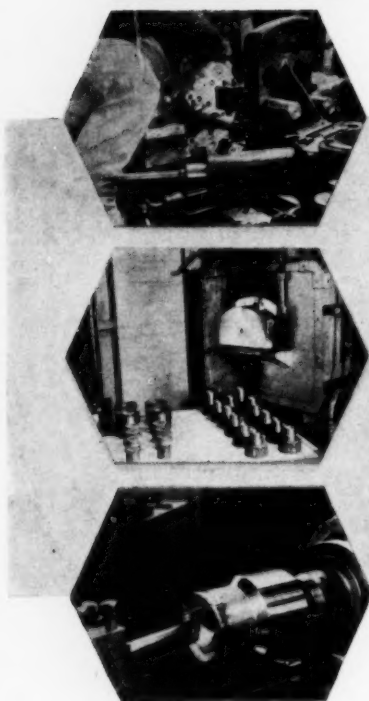
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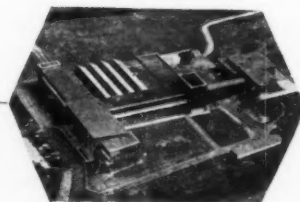
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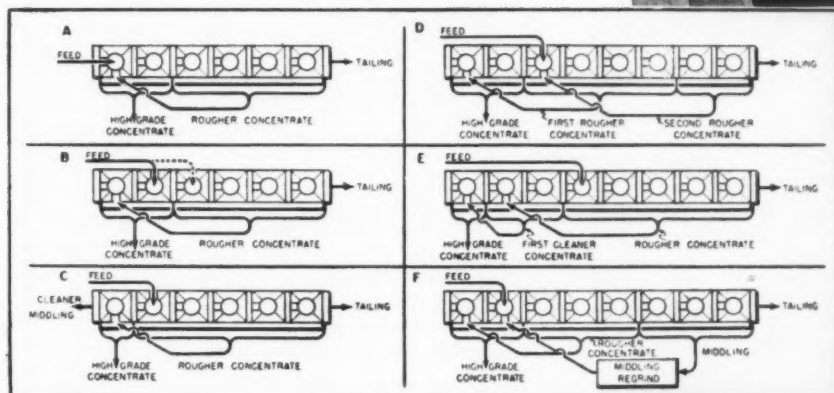
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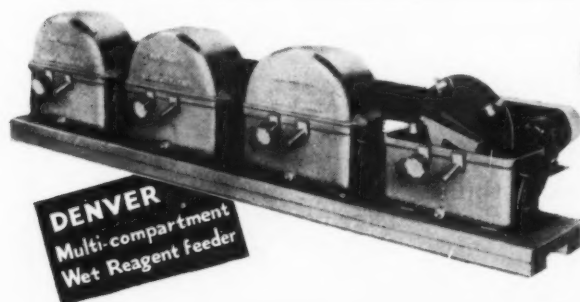


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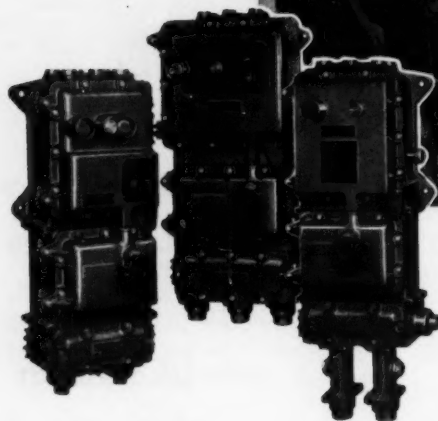
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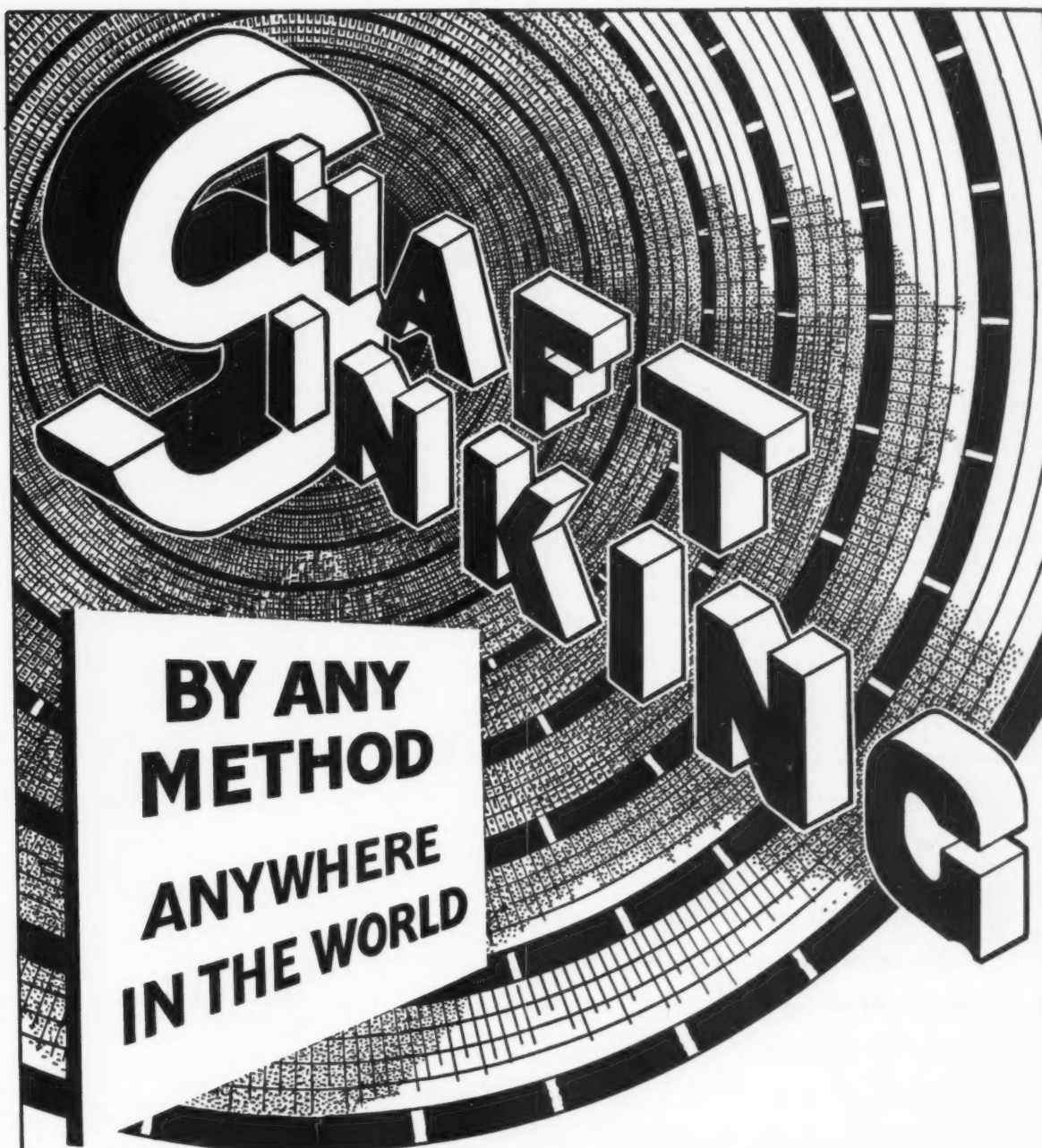


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The Mining Journal

London, January 24, 1958

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A Mild Tonic for Uncle Sam

SINCE the Second World War, U.S. domestic producers and foreign suppliers alike have benefited from Uncle Sam's voracious appetite for metals and minerals of almost every kind. Until quite recently there was no immediate conflict of interests between the domestic mining industry and its potential competitors overseas, because the American Government, like Oliver Twist, kept absorbing all it was offered and coming back for more. Inflated by the high level of government purchases for defence and stockpiling programmes, the prices of essential metals soared to unrealistic heights. Throughout the free world mining companies were encouraged to embark upon major programmes of exploration and expansion, often at the instigation of the U.S. Government and, still more frequently, with the assistance of American finance.

Now that production has temporarily overtaken demand, the chill wind of consumer resistance is sweeping through the metal markets, deflating prices, and piling up stocks in producers' hands. Nowhere is the draught being felt more keenly than in the U.S. itself, where Uncle Sam has sought to reduce his dependence on overseas suppliers by fostering the expansion of production from domestic deposits, many of which are too low-grade to be profitably worked by high-cost American labour at existing prices.

U.S. mining companies whose profits are dwindling to marginal proportions must inevitably view with disfavour competition in the domestic market from foreign suppliers who are more favourably situated, costwise, than themselves. Inevitably, sections of the mining industry have been clamouring for protection in the form of tariffs or import restrictions. Government policy on lead and zinc awaits the report of the specially appointed Tariff Commission, which is expected this month. In the case of copper, Congressmen from mining areas are to introduce Bills calling for a 4 c. duty on imports whenever the domestic market falls below 30 c. per lb.

Underlying the campaigns for higher import duties is what appears to be a fairly widespread inclination to blame Uncle Sam himself for the slump in ore and metal prices. Under foreign aid, it is contended, the U.S. Administration distributes money throughout the world to help "under-developed countries" by building mines for them, thereby using money contributed by American taxpayers to finance the foreign producers that are ruining the country's own industries. At the same time, the government is accused of opening its markets, under the Trade Agreements Act, to foreign products which can be imported and sold at prices lower than the cost of producing similar articles at home. This attitude—by no means confined to the mining industry—is at the root of the stiff opposition expected in Congress to President Eisenhower's budget proposals for a modest increase in the appropriation for this year's foreign aid—from \$3,750,000,000 to \$3,900,000,000—and for an additional \$2,000,000,000 for the Export-Import Bank, now almost up to its limit of \$5,000,000,000.

Unfortunately, Congress is likely to cut foreign aid, though less drastically than last year, while the proposed five-year extension of the reciprocal trade agreement is almost certain to be reduced.

Elsewhere in the Free World, the President's determination that the foreign aid programme shall be not merely maintained at the existing level but even slightly increased, can only be regarded as realistic and statesmanlike, more especially since the greatly reduced prices of raw materials are adding to the economic problems of the "have-not" countries.

There can only be sympathy with the plight of American high-cost producers, who may, indeed, have some justification for feeling that to some extent they have been "led up the garden path" by incentive purchasing programmes and stockpiling policy. It must be apparent, however, that the relationship between the under-developed countries and the U.S. is not one of dependence but of inter-dependence. Apart from the fact that the cold war will ultimately be won or lost on the economic rather than the military front, it must be apparent that foreign aid is effectively a concealed subsidy for U.S. industry.

Global pump priming, as the foreign aid programme has been derisively termed, is in effect, casting bread upon the waters in the sure knowledge that it will return again in the form of expanding markets for American products. Conversely, its curtailment at this critical period could scarcely fail to precipitate the lengthy depression which America fears but still hopes to avoid. Moreover, if the predictions of the more optimistic economists are realized, the time may not be far distant when America's expanding requirements will again call for all the raw materials which overseas producers can supply.

Meanwhile, the Free World's most urgent need is for the recovery of Uncle Sam's own economic health and the restoration of that aggressive self-confidence which has been the mainspring of his phenomenal industrial progress in recent years. Viewed from this aspect, the budget might be described as a mild shot in the arm for U.S. industry which, in conjunction with the reversal of monetary policy in the direction of easier finance, should go some way towards overcoming the recessionary forces now manifest in certain sections of the economy.

All in all, the President's budget aims at injecting new government expenditure to the extent of some \$2,000,000,000 per annum into the economy, which is an impressive figure. On the other hand, the fall in fixed investment alone between the third quarter of 1957 and the first quarter of 1958 was expected to be at an annual rate of about \$2,500,000,000.

Coupled with one or two other signs of improvement, which have recently appeared in the U.S. business horizon, the budget can at least be regarded as casting another faint gleam of light in a sky which still remains thickly overclouded. In itself, however, it is unlikely to restore economic expansion in the U.S. or to generate that confidence which is the most essential pre-requisite of recovery.

AID FOR W. GERMAN LEAD AND ZINC ?

West German lead and zinc ore producers hope that a long-term credit to be guaranteed by the West German Government will help them to overcome present price difficulties and to prevent drastic cuts in production. The credit plan, which is now being discussed between representatives of the mining companies, government officials and bank authorities, provides that the money be made available by the Reconstruction Loan Corporation at Frankfurt. However, size and terms of the credit have not yet been fixed. It is also possible that some other kind of financial help may be arranged.

The fall in the prices of lead and zinc has seriously affected the economics of the industry. The West German mine

production of lead in 1956 was 66,200 tons (in terms of recoverable lead) and that of zinc was 121,800 tons (in terms of recoverable zinc). These quantities covered about 37 per cent of West Germany's requirements for lead and 42.7 per cent of her requirements for zinc.

Among the first effects of the crisis was the suspension of prospecting for and preparing of ore deposits for production by most of the mining companies. Other measures included the recent decision of the state-owned Preussag Mining Co., of Hanover, to close down its Mechernich lead mine, which would reduce domestic mine production by about 12,000 tons of recoverable lead annually. The Aktiengesellschaft des Althenberges, a subsidiary of the Belgian Vieille Montagne Co., decided to reduce its annual production of about 10,000 tons of recoverable zinc and 4,000 tons of recoverable lead by about 50 per cent. The Gewerkschaft Auguste Viktoria Mining Co. planned to reduce its lead and zinc ore production from 1,100 tons a day to 350 tons. The Sachtleben AG., which produced zinc as a by-product of its pyrite product, stopped zinc production, which meant a loss of about 5,000 tons a year.

It has been stated that other important companies, such as the Stolberger Zink Mining Co., of Aachen, which produced about 10,000 tons of recoverable zinc and 4,000 tons of recoverable lead annually, and the Gewerkschaft Stein V Mining Co. with a production of about 20,000 tons of recoverable zinc and 10,000 tons of recoverable lead a year, would be forced to cut their production drastically if some aid could not be arranged in the near future.

The industry, when asking for help, has made it clear that the present crisis resulted neither from structural changes in the lead and zinc markets, nor from uneconomical working of the German mines. The reason for the price slump on both the lead and zinc markets was that world production largely exceeded demand, U.S. stockpile buying having been the main reason why productive capacity for lead and zinc had grown excessively in previous years. The increase in capacity mainly applied to mining industries outside Europe. To reduce capacity to a normal size—the pre-requisite for the restoration of normal relations between supply and demand on the lead and zinc markets—would take a long time, it was stated. The West German mining industry was financially not in a position to wait for the end of the consolidation period.

"OPERATION MACKENZIE"

During the summer of 1957 the Geological Survey of Canada embarked on a geological reconnaissance of 100,000 sq. miles in the western district of Mackenzie, where lies the vast and little explored frontier land of the oil and gas industry of Western Canada. This reconnaissance, known as "Operation Mackenzie", is the seventh to be undertaken by the Geological Survey of Canada, using helicopters to survey large and relatively inaccessible regions. The progress of this major survey is the subject of a recent article by R. J. W. Douglas, Geological Survey of Canada, in *The Northern Miner*.

The region surveyed embraces the drainage basin of the upper Mackenzie River. It extends from latitude 60 deg., the north boundary of the provinces of Alberta and British Columbia, to latitude 64 deg., a distance of some 275 miles, and from the boundary of the interior plains and the Precambrian Shield to longitude 126 deg. on the west. This longitude lies about 100 miles within the Franklin and Mackenzie Mountains. A small part of south-east Yukon falls within the area. The region includes much of the land that is being actively explored at the present time and

has a wide variety of geological features warranting study.

The field party for "Operation Mackenzie" consisted of 29 men, of whom nine were members of the Geological Survey. Associated Helicopters Ltd. supplied, under monthly contract, two Bell 47D1 helicopters, equipped with floats for operating on the plains and with skids for the mountainous terrain. A De Havilland Beaver was chartered from Pacific Western Airlines. It was equipped with ski-wheels at the beginning of the field season and with floats following break-up of the ice. An 85 h.p. river boat and a barge of 10 tons capacity were chartered, both being used for moving equipment, petrol and supplies on the Mackenzie and Liard rivers, and the boat alone for geological traverses.

The helicopters were equipped with VHF radios and carried "Sara" as emergency equipment. Communications with ground parties camped some distance from base camp were established with portable radios.

The Beaver aircraft was employed in establishing petrol and oil caches for the helicopters to extend their range; moving geologists and camp gear, partly in conjunction with the helicopters; general geological reconnaissances; moving base camps; and bringing in supplies and mail. The helicopters were used for geological observations and for movement of staff and camp gear. The relative amounts they were engaged on these two main tasks varied with the terrain, whether the plains or mountains, and the immediate objectives, whether stratigraphic or mapping and

structural. Traverses with a geologist on the plains, were mainly for stratigraphic information, whereas in the mountains they were mainly for mapping and structural data.

Camp equipment was light and was limited, together with two men and food, to what could be carried in two trips—about 800-900 lb. One man and part of both the equipment and food were carried on each trip; more rarely, both machines were used on the same move. Where lakes suitable for landing the Beaver were available, this craft was used as much as possible for moving the party to the lake, whence they were set out at the camp site by helicopters. Where the amount of information to be gained did not warrant establishment of a subcamp, the geologist and assistant were set out on the outcrop in the morning and brought back the same day.

Appraisal of the results and cost of the operation relative to more conventional methods of geological investigation and to other helicopter reconnaissances have yet to be made. As a measure of the work done in the field season of four months, it is stated that the bedrock and glacial deposits were mapped in an area of 100,000 sq. miles, and about 250,000 ft. of stratigraphic section was described and sampled, and the fossils collected. Approximately 450 hours were flown by each of the three aircraft. The cost of field operations was \$135,000; probably considerably less than that of obtaining the same information by standard survey methods, if, indeed, it were possible to penetrate this northern country systematically other than by air.

Minerals in the Deep Freeze

On January 19 Dr. Vivian Fuchs and his 11 British trans-Antarctic explorers arrived at the South Pole, thus successfully accomplishing the first stage of their historic journey across the Antarctic continent.

This achievement is by no means without practical significance for the mining industry, for the time must surely come when the search for minerals will be extended into Antarctica's frozen wastes. The expedition's route across the continent is being very carefully prospected. Both the geologist's hammer and the geiger counter are in constant use, while seismic observations are being taken every 30 miles. The evidence obtained by the expedition should go far to confirm or disprove the Gondwanaland theory, according to which, South America once fitted into the west coast of Africa, while Antarctica—before it split apart—filled in the gaps between Africa and India and the Bay of Bengal. The matching of the coal seams which have already been located in Antarctica with those in India, South America and Africa, would lend weight to the belief that Antarctica is indeed the lost world of Gondwanaland.

Apart from its scientific importance, the mapping which Fuchs and his companions are undertaking will be invaluable to prospectors and mining companies interested in searching for metals and minerals. Though nearly 200

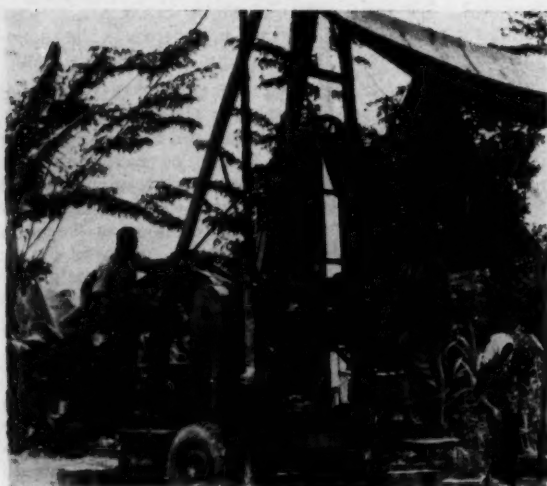
minerals have reportedly been found in Antarctica, Doctor Laurence M. Gould, director of the U.S. programme for the international geophysical year, stated twelve months ago that there was no evidence of commercial mineral deposits of any sort in the Antarctic. He added that if there were any mineral deposits they would most probably be found towards the Ross Sea. It is perhaps significant, therefore, that the extensive coal-field recently discovered by geologists of the New Zealand Antarctic Expedition, under Hillary, is situated in the Ross Dependency.

Every land mass so far explored has mineral deposits in payable quantities, and it may well be that Antarctica is no exception. Having regard to the difficulties of exporting minerals from the remote and inhospitable wilderness surrounding the South Pole, it is evident that, at the present time, only scarce and strategically important materials would be worth mining.

Nevertheless, in the light of the Sputniks, thermo-nuclear fusion, and other developments of the mid-1950's, can we altogether exclude the possibility that some day the South Pole itself might be the centre of a flourishing mining industry for it may be that this industry will produce minerals which we shall not attempt to specify for purposes at which we cannot even guess.

Gondwanaland and Laurasia with orogenic belts, from Dr. A. Holmes' *Principles of Geology*, 1944

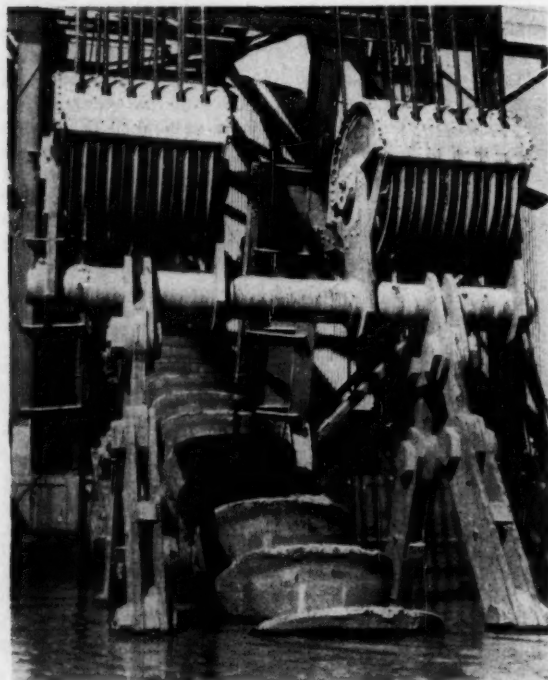




THE activities of the Malayan Department of Mines itself disclose little of outside interest with the exception of the setting up in 1954, co-jointly with the Geological Survey Department, of a mineral investigation drilling unit for the purpose of undertaking prospecting tasks to determine whether or not economic deposits of minerals existed in areas under consideration for development purposes other than mining.

Dealing with the industry, the report contains the following table showing the annual contribution to the national wealth of the products of mining:—

| APPROXIMATE GROSS VALUE OF MINERAL PRODUCTION (M\$000,000) | | | |
|---|-------|----------------|-------|
| Year | Tin | Other Minerals | Total |
| 1950 | 352.9 | 19.6 | 372.5 |
| 1951 | 487.3 | 29.8 | 517.1 |
| 1952 | 458.5 | 36.6 | 495.1 |
| 1953 | 343.4 | 40.2 | 383.6 |
| 1954 | 358.5 | 39.8 | 398.3 |
| 1955 | 376.3 | 49.0 | 425.3 |



A significant feature of the table is the growing importance of "other minerals", which include iron ore, bauxite, columbite, ilmenite and monazite.

Emergency conditions continued to restrict prospecting but some improvement was noticeable from 1953. Nearly 500,000 acres, about 1½ per cent of the land surface, was held under mining titles. Of the total, over one-half was represented by large remaining concessions in Pahang and Trengganu which had not been fully developed. Over 80 per cent of mining land was alienated for tin mining.

The report criticizes the growing practice of State Governments in imposing restrictive express conditions in new mining leases, which, it is affirmed, slowed down the process of issue and inhibited the freedom and efficiency of mining development.

Increased efficiency of dredges has made it possible for modernized dredges to operate successfully in ground yielding recoveries of less than one-third of a katty (1½ lb.) per cu. yd. Some had successfully worked with recoveries of 0.25 katty per cu. yd., whilst still others operated in land with even less recovery value than 0.2 katty per cu. yd.

Of some interest is the enterprise of a Chinese holder of a foreshore licence in Malacca who, in 1954, installed a 3-in. gravel pump driven by a 15 h.p. light diesel engine, the whole housed in a wooden pontoon some 6 ft. by 20 ft.

Five Years

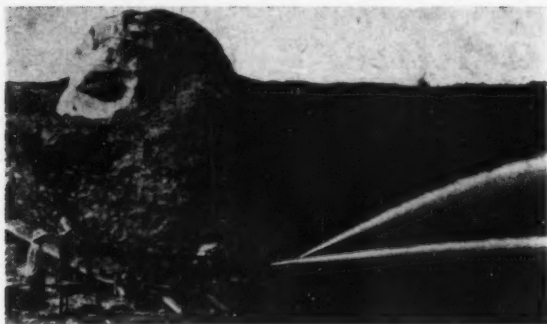
Beach sands were delivered to a sluice box mounted on the deck of the pontoon. This "dredge" is reported to have yielded satisfactory concentrates of heavy minerals, but the fact that it could be operated only at low tide, and the constant vigilance necessary to maintain it on the sea, rendered its operation unrewarding and its life was short. The report makes the trite remark that for statistical purposes this installation was not included in "dredges" or "gravel pumps" but was classified under "Other Methods of Mining".

Significant developments in gravel pump mining included the continued trend towards electrification and a wider use of vertical shaft pumps direct coupled to motors.

Improvement of throughput had also received attention. More use was made of mechanically breaking down hard ground to facilitate disintegration by monitors. Mechani-

Above is a mechanical borer operating in Malaya, while alongside is the bucket ladder and supporting gear of the Kampong Lanjut tin dredge at Kepong, Kuala Lumpur. Below, a mechanical shovel works at the face of the dry-excavated Sungai Besi mine





Above, two monitors are in use at the face of a gravel pump mine, while alongside is an electrically-operated vertical gravel pump of the type in common use in Malaya today. Below, a view of a gravel pump mine's palong



cal shovels and draglines were being used in stripping overburden ahead of the production face. In at least one case, a multi-bucket chain excavator was being used to remove unpayable overburden.

In places where electrical power was not available the

Of Mining In Malaya

The years 1950 to 1955 covered a period of progress in the mining industry of the Federation of Malaya, according to the first Quinquennial Report to be issued by the Department of Mines (Kuala Lumpur, M\$2.00), in place of Annual Reports, the last of which to be published referred to 1949. The following article, based on the Report, has recently been received from our correspondent in Malaya.

trend was towards replacement of heavy slow-speed engine by more flexible light high-speed diesels. Palongs, or sluice boxes, continued to be the common method of primary treatment in gravel pump and hydraulic mines, but a number of operators were experimenting with jig treatment plants.

In the large underground tin mine at Sungei Lembing, in Pahang, improvements during the period reviewed included an extended use of diamond drills in development work, the installation of skip winding in place of the old truck-and-cage system, the replacement in the mill of the California stamp battery with ball mills. A new flotation circuit and additional tables had also been installed. The extension of the employment of belt conveyors in replacement of truck haulage was the most notable feature in dry open-cast mines.

By far the greater part of the report relates to tin mining, as is to be expected in a country which makes such a large contribution to the world supply.

There was a spectacular rise in the output of iron ore, which occurs widely throughout the peninsula, from 498,903 tons in 1950 to 1,466,184 tons in 1955. The substantial rise in labour costs during the years 1950 to 1955 is attributed to a steady rise in the cost of living and the

permanent nature of increments granted to workers during the Korean War period metal boom.

The report refutes the popular idea that miners are responsible for extensive silting of rivers and declares that the effluent waters discharged by most mines are quite harmless. In only a few cases did the solid content even approach the statutory limit. Sanctions were immediately imposed in any case of excess of solids over the legal limit or if harmful sands or silt were discharged.

The mechanized construction of bunds was extending and special measures had been taken to stabilize bunds by vegetation cover. Sensitive plant and rank grasses were found most suitable on sand bunds. On other types of land no special measures were necessary; nature quickly supplied a cover of lush growth.

Mention is made of the solution to the difficult problem presented by the Chenderiang River which had suffered considerable damage during the Japanese occupation. The river had to be trained through a new channel.



Spain's Mining Machinery Needs

MINERALS now occupy (after agricultural exports) second place in the volume and value of Spanish exports. Since 1950 mining has made some recovery from the general depression of the thirties, which was greatly aggravated by the Spanish Civil War from 1936 to 1939. The Second World War, moreover, while promoting demand in world markets for much of Spanish mineral production, notably iron ore and wolfram, nevertheless brought difficulties by preventing the ready acquisition abroad of new machinery and plant.

In 1950 mining conditions took a general turn for the better. The improvement was due to better supplies of material and electric power, to re-equipment aided by American I.C.A. funds, and to improved foreign demand for minerals of which Spain is a major producer; namely, iron, pyrites, lead and mercury. Many old mines were brought back into production, some new deposits were opened up and a considerable amount of prospecting and investigation work was undertaken, chiefly by the State or by para-statal enterprises.

At present the chief production is of coal, iron ore, pyrites, lead, zinc, mercury and potash, while fluorspar, tin, wolfram and other ores are mined on a smaller scale.

Considerable difficulties must still be overcome if the mining industry is to expand substantially. The supply of labour continues to be a pressing problem. Some 300,000 workmen, of whom 100,000 are in coal mining, are engaged in the mining industry and higher wages, bonuses and improved living conditions have failed to attract any larger numbers. Mechanization, where technically feasible, could offset to some extent the shortage of workers but would entail more capital investment and larger imports of plant from abroad.

Requirements and Regulations

The requirements of Spain's coal and other mining industries are considerable. There is manufacture in Spain of many items of equipment, including pit tubs and mine cars, skips and cages, winding engines, crushers, pumping machinery, cap and portable type miners' lamps, ventilators, washing plants, screens, belt conveyors, scrapers, drills and compressors of small and medium size. A good deal of the structural work of mining installations can also be contributed by Spanish firms. Nevertheless, it is estimated that national production of mining equipment covers only some 20 per cent of the requirements of the industry.

There is, therefore, a potential market for all types of heavier equipment either not manufactured in Spain or produced on an insufficient scale, especially large ventilating fans and compressors, heavy pneumatic and electric drills and picks, sharpeners, tungsten bits, belt, chain and shaker conveyors, power loaders, scrapers, washing plants, winding engines and skip winding installations, screens, excavators, large shovel loaders, core drills, blast hole drills, crushers, shuttle cars, diesel and electric locomotives, hydro-drill jibs and coal cutters, the latter, however, of small and medium size.

In view of the urgent need for the re-equipment of Spanish mines, in order to reduce costs and increase production, there should be a lasting market for many years to come.

The customs duties are not excessive and do not represent a major difficulty to the import of mining equipment. All

Spain as a market for mining machinery is the subject of a report prepared by the Commercial Secretariat of the British Embassy in Madrid and issued by the Export Services Branch (Ref. E.S.B. 6470/57).

imports into Spain are subject to a strict licensing system. Applications for import licences for mining machinery require the prior approval of the Dirección General de Minas in Madrid and must be submitted to the Ministry of Commerce accompanied by a certificate from this official organization.

A large proportion of imports of mining machinery is canalized through the Cámara Minera de Vizcaya and on a very much smaller scale through the Cámara Minera de Cartagena and "Operación P."

These organizations handle Spanish exports of iron ore and other minerals and a proportion of the foreign currencies earned is allocated to them by the Spanish Treasury for distribution among mining concerns for the purchase of equipment considered vital to the industry.

Extent of the Market

Despite Spain's many economic problems her mining industry is, with few exceptions, in a high state of activity and can be said to be flourishing. Nevertheless, generally speaking, Spanish mines are insufficiently equipped. Many years have passed since they were originally developed with foreign machinery and in most cases with foreign technicians, and much equipment is in need of repair or replacement.

American aid under the "dollars for bases" agreement signed in 1953 has improved in some measure this state of affairs and up to the end of 1956 no less than \$7,573,000 worth of plant, under the heading of "construction, mining and conveying equipment", were imported into Spain under I.C.A. funds. The greater part, worth \$3,800,000, came from the U.S.A., followed by Germany with \$1,700,000, the United Kingdom with \$1,300,000, Sweden with \$450,000 and France with \$300,000. It should, however, be borne in mind that "construction equipment" accounts for a large proportion of these sums.

Generally speaking, mining machinery enjoys high priority with the Spanish authorities and the granting of licences for equipment not manufactured locally is only limited by foreign currency availabilities.

Although Spanish manufacturers claim to be able to make the majority of the machinery and equipment used in the mining industry. A great deal of this machinery is, in fact, made to meet the client's requirements and is not produced on a large scale. Authoritative opinion within the industry says that much of the Spanish-made material is not up to standard and that there is a definite preference, wherever possible, for imported items.

It should be noted that even if particular types of machinery and equipment are made in Spain, a great deal of similar items are imported, since local production is not standardized and frequently is unable to meet the specifications demanded by the client or cannot be delivered within reasonable time limits.

Enquiries indicate that equipment to the value of some

£2,500,000 a year is imported from all sources. This amount, however, includes items such as excavators and compressors. It is estimated by the trade that if foreign currency were available the Spanish mining industry could absorb equipment to approximately twice this amount.

It can be said that the greater part of the more specialized and heavier type of mining equipment has been imported from Germany, the United States, the United Kingdom and France and on a lesser scale from Belgium, Sweden and Switzerland.

The quality of British-made mining equipment is highly rated by Spanish experts.

Although it is difficult to give any definite statement regarding prices on account of the different characteristics of the mining equipment made by the various countries, generally speaking British prices tend to be somewhat higher than those current for German and Belgian equipment but competitive with the other main suppliers. U.S.A. prices are on the high side, nevertheless their equipment, especially fixed compressors of such well-known firms as Ingersoll Rand, Joy and Chicago Pneumatic, is eagerly sought after. With few exceptions British manufacturers are demanding longer delivery terms than their foreign competitors.

In spite of Spain's shortage of foreign exchange and of the protection given by the Spanish authorities to local manufacturers of mining equipment, a not inconsiderable sum is allotted yearly by Spain for the purchase from abroad of a wide range of mining machinery. It seems reasonable to assume that with the importance now being attached to mining development as a direct contribution to the national economy, either by providing increased supplies of metals or minerals for internal industrial use or by producing greater quantities of foreign exchange, the situation should not deteriorate and may possibly improve. Nevertheless, so far as the United Kingdom is concerned, a great deal continues to depend on the availability of sterling to Spain.

It is to be expected, as a result of American aid to Spain under the Spanish-American economic and military aid agreement, that during the next few years at least, the Spanish mining industry will have a greater opportunity of purchasing machinery and equipment.

American aid offers possibilities of valuable dollar business in Spain as compared with the normal trade which is so strictly controlled by the issue of licences and curtailed by currency shortages.

In this respect it is essential that the agents of United Kingdom manufacturers should keep a close watch on sub-authorizations issued by the "Dirección General de Cooperación Económica". The time limits allowed for bids are usually short, delivery dates must be strictly adhered to, specifications are very exacting and price competition extremely keen.

This report would not be complete without some mention of the advisability of manufacturing in Spain under licence. This is a debatable question, but United Kingdom manufacturers wishing to strengthen their position on the Spanish market might well consider coming to an agreement with an existing Spanish manufacturer to have certain items of mining machinery made in Spain under a royalty agreement, merely supplying drawings and technical advice and assistance. In this case once the contract has been approved by the Spanish authorities the annual sterling remittances of royalties (usually not more than 5 per cent) is made available for transfer to the United Kingdom firms concerned.

Should United Kingdom manufacturers desire to invest capital in Spain in collaboration with Spanish industrialists, permission must be obtained and foreign investors are normally limited to holding up to 25 per cent of the capital of the company to be formed.

BRITISH COAL DEVELOPMENTS

MANY of the advances made in British coal mining techniques are the result of the "know-how" of employees. A novel chain-driven ram in successful use at Parsonage Colliery, near Wigan, has been developed because conditions at Parsonage render it impossible to use a normal ram type of cage-loading gear.

The ram is installed at the pit bank. Two 6 in. by 3 in. channels are braced together with plates or girders which are attached to the tub rails at each deck level. A small pusher-head, fitted with rollers, runs in the channels along the centre-line of each set of rails. These pushers, which are designed to engage the axles of tubs on the rails, are each attached to a continuous creeper chain running in the channels for the full length of the track. A Renold chain with a pitch of 2.4 in. is used.

Each pusher-head has a stroke of 14 ft., which allows it to ram four empty tubs into the appropriate deck of the cage, these tubs in turn pushing out four full tubs at the far side of the cage.

An arrangement of mine car catches operated by tilting platforms for use at Douglas Colliery is suitable for use in conjunction with cages that employ travelling car arrestors, in shafts without rigid end-guides.

In the arrangement at Douglas, when the cage decks at the pit bottom, the tilting platforms are brought down by pneumatic pressure against the ends of the cage deck. Near the centre of the tilting platform at the off-going side is fitted an extra toe which depresses a treadle on the cage deck. This in turn, through a linkage, lowers the car catch at the off-going end of the cage, allowing the empty car to be rammed off by the incoming full car. The car catch at the on-going side is depressed by the incoming full car and is balanced so as to rise when the car is correctly positioned in the cage.

A Perkins-engined fleet is helping to haul coal from open-cast mines at Newcastle upon Tyne to screening plants before grading and dispatch to commercial and domestic customers. One of many firms engaged on this work is J. Heslop (Haulage) Ltd., of Newcastle, which operates a fleet of 18 Perkins-powered Bedfords on behalf of Derek Crouch (Contractors) Ltd.

The fleet consists of 17 seven-ton R6 tippers and one P6 five-tonner. It handles about 1,400 tons of coal a day.

One of the Perkins' fleet in the operations at Newcastle



Britain's Growing Dependence on

Imported Iron Ore

TOO often in the past, British steel has been caught short. The long-term growth in the demand for steel has been underestimated and even now there are significant shortages of certain types of steel products, notably plates for the shipbuilders and sheets for the motor industry and manufacturers of durable consumer goods. For these mistakes the country has had to pay dearly in the past. Other industries have suffered grave embarrassments through the steel shortage and huge tonnages have had to be imported at inflated prices.

These errors will not be repeated. Undeterred by what is believed to be no more than a temporary decline which may be of no more than six months' duration, the industry remains committed to a five years' development plan designed to raise productive capacity from 23,000,000 tons to 28,290,000 tons in 1962.

Obviously, the implementation of such a large-scale expansion project will call for the mobilization of vastly increased tonnages of iron ore, and since there are definite limits to increases in the raisings of home orders, very much larger tonnages will be required from overseas sources.

The Foreign Ore Trade

In a topical article featured in the current issue of *Steel Review*, the official organ of the British Iron and Steel Federation, Mr. T. B. Roddy, general manager of B.I.S.C. (Ore) Ltd., traces the history of the foreign ore trade from its early origins in 1870. Prior to that year practically the whole of the pig iron produced in the U.K. was made from native ores. Mr. Roddy also indicates the immense scope of the plans that have been evolved to ensure an ample flow of the basic raw material of the iron and steel industry.

The decisive change in the organization of the foreign ore trade came in the year 1939. Formerly, the trade was almost wholly in the hands of a few great merchant firms, but the prior indications of the inevitable drift into the Second World War gave time for the preparation of comprehensive plans for the control of iron ore imports from the moment the war commenced.

Immediately, control was put into the hands of a Foreign Ores Department, a branch of the Iron and Steel Control, and subsequently, when peace was restored to a troubled world, the control organization of ore imports was continued through the newly-created B.I.S.C. (Ore) Ltd.

Here the story is taken up by Mr. D. H. Kyle, O.B.E., managing director, who shows how B.I.S.C. (Ore) Ltd. was incorporated in March, 1946, as the direct outcome of a recommendation by the British Iron and Steel Federation in favour of centralized purchasing of ore and centralized shortening of the necessary shipping.

Since those early days the authority and functions of this subsidiary of the British Iron and Steel Corporation have been widely extended:

It buys all the imported ore required by the United Kingdom usually on an f.o.b. basis; it secures the necessary shipping; it distributes the imported ore to the works in accordance with their annual consumption, adjusted to allow for expansion, and it charges an agreed stabilized c.i.f. price to the consumer, the difference between this and the actual cost being accounted for through the Industry Fund.

For the first time since the war, the word "redundancy" has crept into the vocabulary of the British steel industry. With an annual capacity of not less than 23,000,000 tons—that rate was, in fact, achieved as long ago as May, 1957—last year's output fell 700,000 tons short of the original target figure of 22,400,000. The industry is not unduly alarmed. To offset what is thought to be no more than a brief reversal of a rising demand which has been continuous for more than a decade, the industry plans to cut still further imports from abroad which were halved in 1957 and hopes to surpass its export record of 4,000,000 tons last year.

The tonnages purchased and shipped by this agency are profoundly impressive. During the ten years 1946 to 1956 the annual imports have risen from 6,700,000 tons to 14,796,000 tons and are still increasing, but even more impressive is the ever-widening quest for supplies.

"The list," says Mr. Kyle, "ranges from French Guinea to the Shetlands, and from the island of Tirce on the West Coast of Scotland up to the Sydvaranger mine in the Arctic Circle. We have been active deep in the Sahara. We have had engineers in Spain and others in Canada and Malaya. Recently our men were working as far south as Senegal, and as far north as the Lofoten Islands. Since B.I.S.C. (Ore) Ltd. first started I personally have been right through Sweden, Norway, Brittany, Morocco—both French and Spanish—Algeria, Tunisia, Spain and Labrador—all this work has considerably expanded the circle of suppliers from whom Britain's exports can be drawn."

Of the development of Conakry in French Guinea, which is described as "a peninsula almost literally made of iron ore", Mr. Kyle reveals that the reserves amount to 250,000,000 tons and that shipments to the U.K. are running at the rate of 600,000 tons a year, B.I.S.C. (Ore) Ltd. having put up one-third of the huge capital sums spent in development.

Fleets of Ore Carriers

But perhaps B.I.S.C.'s most effective work has been accomplished in the marshalling of the fleets of ore carriers for the transport of supplies from the loading ports to the ore terminals. Seventeen specially-designed ore carriers have been built for the service, another seventeen will be available within the next twelve months and no less than 72 will be operating in 1962. The rate of discharging has been considerably increased by the installation of special mechanized plant and as a result the average rate of discharge had increased from 1,264 tons a day in 1951 to 2,035 tons a day in 1956.

Thus, in the ten years of its incorporation, B.I.S.C. has handled 108,599,000 tons of foreign ore. The total f.o.b. cost of that tonnage was £326,500,000, and the freight charges aggregated £187,500,000, making the total outlay £514,000,000. It is inconceivable that so much ore could have been obtained so cheaply had British steel companies dealt independently in competition with each other and with foreign buyers, for relatively scarce supplies of ore and shipping. Thus, B.I.S.C. can reasonably claim to have rendered valuable service to an expanding industry.

Machinery and Equipment

A Small Tool on a Big Job

In sand and gravel quarrying, new pits have to be dug from time to time, involving a considerable amount of preliminary prospecting and sampling. An area is first selected and soundings made at various depths until sand or gravel is reached. Samples of the ground are then taken and the results analyzed and graded. This probing of the ground may mean drilling down to a depth of 18 or 20 ft., but, generally speaking, unless something is struck at 8 ft. the site is not worth developing. This experimental drilling is usually undertaken by specialist firms with equipment facilities, and the cost of these sampling tests frequently worked out at as much as £1 per foot drilled.

Ferrersands, Ltd., have for some time used a Wolf drill in their repair shop, and after studying its capabilities considered that if a powerful enough Wolf tool was available, it could provide the driving force to enable the company to carry out its own drilling tests.

The idea was developed, and eventually a Wolf 1½ in. heavy-duty drill type NW10 was bought locally. The firm already possessed a portable generator, and so were in a position to carry out drilling tests in areas remote from standard power supply.

Accordingly, earth-boring equipment was obtained which included a number of 4-in.-dia. earth augers of several types to meet varying soil conditions, sampling heads for both wet and dry material, and a number of extension rods to enable considerable depths to be reached.

Operation proved so simple that the operator held the drill in his hands and fed the auger into the ground, adding extension rods as the depth increased.

This new method of earth boring was so successful that the drill paid for itself the first time it was used, and Ferrersands estimate that the cost of their sampling operations is now in the region of 2s. per foot as against the previous cost of £1 a foot. A saving of 90 per cent.

The load imposed upon this Wolf drill in earth-boring work, especially when penetrating blue clay, is extremely heavy, but the machine is said to possess ample power reserves for all requirements.

AN HYDRAULIC PROP

An hydraulic prop for use with Meco-Moore cutter-loaders to prevent the machine being forced away from the coal face when working to the rise of a seam inclined at 1 in 3 has been designed in the North Staffordshire area, National Coal Board.

The prop is contained in a welded steel frame which is attached to the loader in such a way that the freely revolving

pulley-wheel at the end of the prop engages the ridge in the coal roof formed by a roof-cutting jib of the loader. It can only be used when such a ridge is present and its application is therefore limited to conditions where the roof is made by the cutting action of the machine.

When the prop is in position, it can be adjusted hydraulically to give the thrust required to keep the machine well up to the face.

METHODS OF HOSE COUPLING

To speed the fitting and renewal of connections to hosepipes, the Consolidated Pneumatic Tool Co. have introduced a new piece of equipment consisting of a 2½ in. dia. single-acting spring-return cylinder with a 3 in. stroke piston, the cylinder being mounted on a baseplate with a hose clamping vice facing the cylinder and piston and mounted on the same baseplate. The two jaws of the vice are fitted with removable inserts to accommodate different diameters of hosepipe.

Air control is achieved through a single-acting hand-operated valve to which is fitted a CP air-flow regulator. Sleeves are supplied for the piston rod to suit various types of hose fittings. Operation of the unit consists of gripping the hosepipe in the vice, fitting a hose connection to the piston rod, and operating the air valve. Fitting is thus carried out in a moment, and experience has shown that a connection can be adequately pressed home even in a high-pressure reinforced hydraulic hose.

Since the introduction of long-length hose by Goodyear some twelve months ago, the range has been considerably extended. Today, hose in a wide variety

of sizes and of different constructions is available for a large number of applications. Long-length hose is supplied in lengths up to 500 ft. for sizes up to and including 1 in. dia. and up to 250 ft. for sizes above 1 in.

The long-length water hose is available in two styles: Style A having either smooth or corrugated cover; and Style B having black corrugated or red smooth covers. Style A is designed to give excellent service under general operating conditions, and its balanced construction ensures flexibility for easy handling and coiling. The broader ribs of Style A corrugated hose makes it easily distinguishable from Style B. Style B is designed for lower working pressures. Long-length water hose is available from ½ in. up to 1½ in. internal diameter.

The long-length air hose is supplied in two styles, both having either smooth or corrugated black covers; Style B is also available with red covers. Style A is recommended for general service with light or medium pneumatic tools, especially where oil mist is present in the air line. It is designed for higher pressures than are normally used for this type of duty. Style B is designed to give a good service life under conditions encountered in light or medium pneumatic tool service. All types of air hose are available in sizes from ⅜ in. to 1½ in. i.d.

The long-length oxy-acetylene hose is available with either smooth or corrugated cover. In both cases the tube is seamless, non-porous and unaffected by the gases, and is specially compounded so as not to support combustion in the event of a blow-back. This is a strong extremely flexible hose designed for general welding and cutting service. Long-length oxy-acetylene hose is available in all sizes from ⅜ in. to 1½ in. i.d.

The long-length solvent hose has a specially prepared bore compound which is resistant to oils and greases.

Airtech, Ltd., announce the availability of a new hose coupling for use with low- and medium-pressure compressed air and fluids. These couplings are already in use in steelworks, factories, and coal mines throughout Europe.

The Airtech Free-End coupling offers the following advantages: It forms a



The hydraulic prop in operation at the coal face of Holditch Colliery

one-piece unit which need never be dismantled; no preparation of the end of the hose is required; no tools of any description are required for fitting or removing the hose; there are no separate bolts, nuts, clips, screws, inserts, ferrules; for a given inside diameter of hose a given coupling can accept varying wall thicknesses; the hose can be entered or removed as often as required; average time for effecting a joint is 10 sec.; and it is exceptionally light in weight when manufactured in nylon.

Two types of couplings manufactured in nylon and suitable for working pressures up to 250 p.s.i. are the Type D, for joining two lengths of rubber or plastic hose together, and the Type S. One end of this coupling is threaded for attachment to a tool or to a supply point, where the coupling can remain permanently. The other end accepts the free end of the hose, which is locked tightly by screwing home the body portion by hand, and is as quickly removed. Similar couplings manufactured in brass will shortly be available.

A NEW LOADING SHOVEL

A new four-wheel-drive four-wheel-steer loading shovel suitable for off-road or yard use is the Matbro Mastiff, manufactured by Mathew Bros. The machine is claimed as the first United Kingdom equal four-wheel-drive loading shovel. It can be visualized as operating at stockpiles, in ore and waste removal, or in quarry and opencast workings.

The Mastiff has torque converter with 3-to-1 torque ratio, hydraulic power steering, and a bucket capacity of 1½ cu. yd. heaped. Payload is 4,000 lb. maximum working and carrying load. The centre point articulated steering, requiring only one universal joint, maintains the four-wheel drive and steer continually engaged so that full power is available at the turn.

Lift height is 120 in. under bucket hinge, 98 in. under bucket tip at 30 deg. dump angle, and 93 in. at 45 deg. dump angle. Outreach is 38 in. from bucket tip at 84 in. height to 22 in. from bucket tip at 98 in. height. Full height of main arms achieved in 6 sec.

The Mastiff has four forward speeds to 16 m.p.h. and two reverse to 8 m.p.h. Gross working weight is 15,000 lb.

AUTOMATIC PART FEEDING

The Magco bowl feeder, manufactured by The Magnetic Equipment Co. Ltd., is designed to take parts in bulk quantities and deliver each part automatically oriented in the required direction. The delivery speed can be changed from zero to the maximum and can be changed while the bowl is operating.

Bowl feeders are used in many industries wherever it is necessary to feed forward parts, and can be visualized as finding application in surface installations in the mining industry or in the plants of mining machinery manufacturers.

It is stated by the manufacturers that, by eliminating the hand-feeding of parts for assembly purposes, increases in output of several hundred per cent are obtained.

Additionally, spiral elevators provide an infinitely variable feed without maintenance, it being possible for a wide range of materials from powders to lumps to be handled.

Technical Briefs

Predicting Underground Rock Falls

Methods and equipment developed by U.S. Bureau of Mines' scientists for predicting falls of rock in underground mines are described in a report released by the Department of the Interior.

The cracking and popping of mine rock long has served to warn miners of unstable ground. In recent years, however, science has learned that rock under stress generates sub-audible noises called microseisms. Techniques and instruments devised by Bureau physicists make it possible to detect, amplify, and record these noises and, having done so, to predict with reasonable accuracy when mine rock will fail.

This gives longer forewarning of danger and also permits miners to know in advance the condition of the area in which they are working.

The method developed by the Bureau uses geophones, which are inserted in mine rock to pick up microseisms and transmit them to a combination amplifier and recorder. Predicting the failure of rock in a given area is possible, because the frequency of the sub-audible noises increases with stress.

According to the report, the method has been used successfully to detect partly detached pieces of rock in mine roof; to determine the stability of underground openings; and to study rock burst problems, which frequently arise in deep mines where tremendous pressures sometimes cause rock to rupture suddenly with explosive force.

Besides summarizing fifteen years of experimental work with the so-called microseismic method, the report gives examples of the various types of mining problems to which the method can be applied, and discusses several specific investigations in which it was employed.

METALLIC BORIDES IN THE U.K.

A comprehensive range of metallic borides is now available in the United Kingdom. This is revealed in an announcement by Borax Consolidated, Ltd., that they are now able to supply two series of borides, one of high chemical purity (not less than 99.8 per cent) and the other comprising technical grades of minimum purity of the order of 99 per cent.

Several borides of the more important metals such as chromium, molybdenum and tungsten appear either in one or both of the ranges, as well as the borides of some of the less common metals such as titanium, zirconium, vanadium, niobium and tantalum.

The high melting points of metallic borides (up to 3,100 deg. C.), and their hardness, make them compounds of major metallurgical interest. Their corrosion resistance, both to noxious gases and to liquid or gaseous metals, has stimulated research into the possibilities of their use in gas turbines and other locations where their inert character is of importance.

Many research organizations are investigating fabrication techniques, both from the point of view of pressing by

powder metallurgy techniques and of forming coatings on metals or alloys. The part they play in cermet—the new series of metal-ceramic compounds—is well known, and they may also be of use in tools and dies. Zinc, aluminium and uranium concerns are taking an interest and as development work progresses their unique properties will find for them an ever-increasing range of applications.

The eleven compounds in the pure series are dense, hard powders of average particle size of 10-50 microns, and the fourteen in the technical series are finer, averaging 5-10 microns in particle size.

Two technical data sheets—one for each series—have been published by Borax Consolidated, Ltd. These list the chemical analysis, specific gravity, melting point and hardness of each compound. The electrical conductivities, which are of some importance in certain applications, are also included.

TUNGSTEN SPONGE AS ADDITIVE FOR SPECIAL STEELS

What is said to be a cheaper and metallurgically superior substitute for ferro-tungsten is now being produced by Metals and Residues, Inc., United States. Ferro-tungsten is used as a tungsten additive in the production of high-speed and other tungsten-bearing steels.

The new product, called M. and R. tungsten sponge mix, is a direct outgrowth of a recently developed process for winning tungsten from its ores by a direct pyrometallurgical procedure which obviates the multiple and time-consuming steps involved in the conventional process.

The name of the product is derived from the fact that when the mix is heated to a sufficiently high temperature, it yields an extremely porous, sponge-like mass of metallic tungsten which goes into complete solution very rapidly.

The tungsten sponge mix is expected to sell at any given time for approximately 30c. to 40c. less per lb. of tungsten contained than ferro-tungsten.

RECORDING PENETRATION

An instrument for recording the rate of penetration when boring through coal seams has been devised in the East Midlands Division, N.C.B.

The instrument produces a graph with a continuous curve of depth penetrated against time, and is for use with drilling machines fitted with a hydraulic head.

The curve is recorded on a drum driven at a speed of one revolution per hour. The drum is large enough to accommodate a graph 3 in. high and 6 in. in circumference; this allows for a graph to be produced to the scale of 1 in. to 10 in. and 1 in. to 10 min., with an average rate of penetration of ¼ in. per min.

A suitable stylus, such as a ballpen with interchangeable colours, is attached to a vertical slide so that it makes contact with the graph.

MINING MISCELLANY

The coal mine at Grone, in Canton Valais, Switzerland, has been closed as unprofitable. Most of the anthracite mined was exported to Italy.

The production of electrolytic copper in Japan during 1957 amounted to the record figure of 142,171 tons. Output in 1956 was 126,156 tons.

It is reported from Washington that there might be a slight delay in releasing the Advisory Committee's report to the U.S. Office of Defence Mobilization on U.S. stockpiling policy, due to illness of the O.D.M. Director, Mr. Gordon Gray.

According to the *Industrial and Economic Gazette*, important deposits of non-ferrous metals have been found in the Carpathian area of the Ukraine in the districts of Lvov, Rovno and Tarnopol (formerly eastern Poland). The discoveries are reported to include mercury, tin and zinc ores.

The Maranboy tinfield near Katherine in the Northern Territory could become Australia's largest producer of tin, according to the general manager of United Uranium, Mr. Frank Jones. If successful, the field could produce up to 500 tons of tin ore daily. United Uranium, King Island Schectel, and Loloma Gold Mines of New Guinea have joined in a prospecting venture in this field.

Hungary's quest for metallic ores is meeting with considerable success, according to Mr. Balin Papp, Director of the Ministry for Heavy Industry, who has said that the results of the search in the Matra mountains for gold, silver, lead, zinc and copper ores were "promising". He added that lead and zinc ores were being sought in the Velencei mountains, iron ore between Rudabanya and Kelecseny, and manganese in the areas around Urkut and Epleny.

A large non-ferrous industry will soon be set up in the Pacific area of the U.S.S.R., based mainly on Komsomolsk, on the Amur. According to the *Industrial and Economic Gazette*, development of this industry has been hampered so far by the lack of electric power for smelters, but with the completion of the new Siberian power stations it will no longer be necessary to transport ore to smelting plants, which are often 1,000 miles from the mines.

Preparatory work is in progress to achieve complete mechanization of the South African Iron and Steel Corporation's iron-ore mine at Thabazimbi, some eighty miles north of Rustenburg, in the Transvaal, one of the aims being to increase output by 50 per cent without any addition to the labour force. The programme includes the installation of gathering-arm loaders capable of handling up to twelve tons of ore a minute.

The Director of Industrial and Mines Production of Morocco, Mr. Mohammed Mehdi Ben Abdel Jelil, states that in 1957 the total value of the Morocco mines' output was Frs.60,000,000,000

(Moroccan)—about £50,000,000—an increase of 20 per cent over the figures for 1956. It is expected that this year exports of ore will reach 45 per cent of the total Moroccan exports. New laws to provide more favourable conditions for mining companies are being prepared.

Production of lignite in Denmark increased so much in 1957 that it was expected to reach the record figure of 3,000,000 tonnes. The three largest electric power-stations in Southern Jutland alone take a daily quantity of between 600 and 1,500 tons. They are said to have invested a total of up to Kr.20,000,000 in the brown coal industry.

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one-piece unit which need never be dismantled; no preparation of the end of the hose is required; no tools of any description are required for fitting or removing the hose; there are no separate bolts, nuts, clips, screws, inserts, ferrules; for a given inside diameter of hose a given coupling can accept varying wall thicknesses; the hose can be entered or removed as often as required; average time for effecting a joint is 10 sec.; and it is exceptionally light in weight when manufactured in nylon.

Two types of couplings manufactured in nylon and suitable for working pressures up to 250 p.s.i. are the Type D, for joining two lengths of rubber or plastic hose together, and the Type S. One end of this coupling is threaded for attachment to a tool or to a supply point, where the coupling can remain permanently. The other end accepts the free end of the hose, which is locked tightly by screwing home the body portion by hand, and is as quickly removed. Similar couplings manufactured in brass will shortly be available.

A NEW LOADING SHOVEL

A new four-wheel-drive four-wheel-steer loading shovel suitable for off-road or yard use is the Matbro Mastiff, manufactured by Mathew Bros. The machine is claimed as the first United Kingdom equal four-wheel-drive loading shovel. It can be visualized as operating at stockpiles, in ore and waste removal, or in quarry and opencast workings.

The Mastiff has torque converter with 3-to-1 torque ratio, hydraulic power steering, and a bucket capacity of 1½ cu. yd. heaped. Payload is 4,000 lb. maximum working and carrying load. The centre point articulated steering, requiring only one universal joint, maintains the four-wheel drive and steer continually engaged so that full power is available at the turn.

Lift height is 120 in. under bucket hinge, 98 in. under bucket tip at 30 deg. dump angle, and 93 in. at 45 deg. dump angle. Outreach is 38 in. from bucket tip at 84 in. height to 22 in. from bucket tip at 98 in. height. Full height of main arms achieved in 6 sec.

The Mastiff has four forward speeds to 16 m.p.h. and two reverse to 8 m.p.h. Gross working weight is 15,000 lb.

AUTOMATIC PART FEEDING

The Magco bowl feeder, manufactured by The Magnetic Equipment Co. Ltd., is designed to take parts in bulk quantities and deliver each part automatically oriented in the required direction. The delivery speed can be changed from zero to the maximum and can be changed while the bowl is operating.

Bowl feeders are used in many industries wherever it is necessary to feed forward parts, and can be visualized as finding application in surface installations in the mining industry or in the plants of mining machinery manufacturers.

It is stated by the manufacturers that, by eliminating the hand-feeding of parts for assembly purposes, increases in output of several hundred per cent are obtained.

Additionally, spiral elevators provide an infinitely variable feed without maintenance, it being possible for a wide range of materials from powders to lumps to be handled.

Technical Briefs

Predicting Underground Rock Falls

Methods and equipment developed by U.S. Bureau of Mines' scientists for predicting falls of rock in underground mines are described in a report released by the Department of the Interior.

The cracking and popping of mine rock long has served to warn miners of unstable ground. In recent years, however, science has learned that rock under stress generates sub-audible noises called microseisms. Techniques and instruments devised by Bureau physicists make it possible to detect, amplify, and record these noises and, having done so, to predict with reasonable accuracy when mine rock will fall.

This gives longer forewarning of danger and also permits miners to know in advance the condition of the area in which they are working.

The method developed by the Bureau uses geophones, which are inserted in mine rock to pick up microseisms and transmit them to a combination amplifier and recorder. Predicting the failure of rock in a given area is possible, because the frequency of the sub-audible noises increases with stress.

According to the report, the method has been used successfully to detect partly detached pieces of rock in mine roof; to determine the stability of underground openings; and to study rock burst problems, which frequently arise in deep mines where tremendous pressures sometimes cause rock to rupture suddenly with explosive force.

Besides summarizing fifteen years of experimental work with the so-called microseismic method, the report gives examples of the various types of mining problems to which the method can be applied, and discusses several specific investigations in which it was employed.

METALLIC BORIDES IN THE U.K.

A comprehensive range of metallic borides is now available in the United Kingdom. This is revealed in an announcement by Borax Consolidated, Ltd., that they are now able to supply two series of borides, one of high chemical purity (not less than 99.8 per cent) and the other comprising technical grades of minimum purity of the order of 99 per cent.

Several borides of the more important metals such as chromium, molybdenum and tungsten appear either in one or both of the ranges, as well as the borides of some of the less common metals such as titanium, zirconium, vanadium, niobium and tantalum.

The high melting points of metallic borides (up to 3,100 deg. C.), and their hardness, make them compounds of major metallurgical interest. Their corrosion resistance, both to noxious gases and to liquid or gaseous metals, has stimulated research into the possibilities of their use in gas turbines and other locations where their inert character is of importance.

Many research organizations are investigating fabrication techniques, both from the point of view of pressing by

powder metallurgy techniques and of forming coatings on metals or alloys. The part they play in cermets—the new series of metal-ceramic compounds—is well known, and they may also be of use in tools and dies. Zinc, aluminium and uranium concerns are taking an interest and as development work progresses their unique properties will find for them an ever-increasing range of applications.

The eleven compounds in the pure series are dense, hard powders of average particle size of 10-50 microns, and the fourteen in the technical series are finer, averaging 5-10 microns in particle size.

Two technical data sheets—one for each series—have been published by Borax Consolidated, Ltd. These list the chemical analysis, specific gravity, melting point and hardness of each compound. The electrical conductivities, which are of some importance in certain applications, are also included.

TUNGSTEN SPONGE AS ADDITIVE FOR SPECIAL STEELS

What is said to be a cheaper and metallurgically superior substitute for ferro-tungsten is now being produced by Metals and Residues, Inc., United States. Ferro-tungsten is used as a tungsten additive in the production of high-speed and other tungsten-bearing steels.

The new product, called M. and R. tungsten sponge mix, is a direct outgrowth of a recently developed process for winning tungsten from its ores by a direct pyrometallurgical procedure which obviates the multiple and time-consuming steps involved in the conventional process.

The name of the product is derived from the fact that when the mix is heated to a sufficiently high temperature, it yields an extremely porous, sponge-like mass of metallic tungsten which goes into complete solution very rapidly.

The tungsten sponge mix is expected to sell at any given time for approximately 30c. to 40c. less per lb. of tungsten contained than ferro-tungsten.

RECORDING PENETRATION

An instrument for recording the rate of penetration when boring through coal seams has been devised in the East Midlands Division, N.C.B.

The instrument produces a graph with a continuous curve of depth penetrated against time, and is for use with drilling machines fitted with a hydraulic head.

The curve is recorded on a drum driven at a speed of one revolution per hour. The drum is large enough to accommodate a graph 3 in. high and 6 in. in circumference; this allows for a graph to be produced to the scale of 1 in. to 10 in. and 1 in. to 10 min., with an average rate of penetration of ¼ in. per min.

A suitable stylus, such as a ballpen with interchangeable colours, is attached to a vertical slide so that it makes contact with the graph.

MINING MISCELLANY

The coal mine at Grone, in Canton Valais, Switzerland, has been closed as unprofitable. Most of the anthracite mined was exported to Italy.

The production of electrolytic copper in Japan during 1957 amounted to the record figure of 142,171 tons. Output in 1956 was 126,156 tons.

It is reported from Washington that there might be a slight delay in releasing the Advisory Committee's report to the U.S. Office of Defence Mobilization on U.S. stockpiling policy, due to illness of the O.D.M. Director, Mr. Gordon Gray.

According to the *Industrial and Economic Gazette*, important deposits of non-ferrous metals have been found in the Carpathian area of the Ukraine in the districts of Lvov, Rovno and Tarnopol (formerly eastern Poland). The discoveries are reported to include mercury, tin and zinc ores.

The Maranboy tinfield near Katherine in the Northern Territory could become Australia's largest producer of tin, according to the general manager of United Uranium, Mr. Frank Jones. If successful, the field could produce up to 500 tons of tin ore daily. United Uranium, King Island Schectel, and Loloma Gold Mines of New Guinea have joined in a prospecting venture in this field.

Hungary's quest for metallic ores is meeting with considerable success, according to Mr. Balin Papp, Director of the Ministry for Heavy Industry, who has said that the results of the search in the Matra mountains for gold, silver, lead, zinc and copper ores were "promising". He added that lead and zinc ores were being sought in the Velencei mountains, iron ore between Rudabanya and Kelecseny, and manganese in the areas around Urkut and Epleny.

A large non-ferrous industry will soon be set up in the Pacific area of the U.S.S.R., based mainly on Komsomolsk, on the Amur. According to the *Industrial and Economic Gazette*, development of this industry has been hampered so far by the lack of electric power for smelters, but with the completion of the new Siberian power stations it will no longer be necessary to transport ore to smelting plants, which are often 1,000 miles from the mines.

Preparatory work is in progress to achieve complete mechanization of the South African Iron and Steel Corporation's iron-ore mine at Thabazimbi, some eighty miles north of Rustenburg, in the Transvaal, one of the aims being to increase output by 50 per cent without any addition to the labour force. The programme includes the installation of gathering-arm loaders capable of handling up to twelve tons of ore a minute.

The Director of Industrial and Mines Production of Morocco, Mr. Mohammed Mehdi Ben Abdel Jelil, states that in 1957 the total value of the Morocco mines' output was Frs.60,000,000,000

(Moroccan)—about £50,000,000—an increase of 20 per cent over the figures for 1956. It is expected that this year exports of ore will reach 45 per cent of the total Moroccan exports. New laws to provide more favourable conditions for mining companies are being prepared.

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applications for Fellowships of an approximate value of £900 to £1,200 for 1958. Particulars and forms of application are available from the Secretary, Mond Nickel Fellowships Committee, 4 Grosvenor Gardens, London, S.W.1. Completed application forms are required by June 1, 1958.

Mr. G. G. Middleton has relinquished his position as mining sales manager for Victor Products (Wallsend), Ltd., and has been appointed general sales manager with responsibility for co-ordinating the actual sales achieved by the three sales sections: home mining, export and industrial. Mr. J. M. Wigley takes over the responsibilities for home mining sales. Mr. E. Roseby succeeds Mr. Wigley as London manager. Mr. E. Thompson, formerly Durham mining district office manager, becomes Lancashire and North Wales mining district office manager in Mr. Roseby's place.

Mr. L. E. Van Moppes, chairman of L. M. Van Moppes and Sons (Diamond Tools), Ltd., has been elected chairman of the Gauge and Tool Makers' Association.

In our last week's issue, page 63, reference was made to Sir Ronald Prain's observations at what was incorrectly termed a "formal" meeting of R.S.T. Group shareholders. The meeting in question was, in fact, an informal one.

COMPANY EVENTS

Following a reorganization programme at their Cappelow factory at Greenock, Scotland, Joy-Sullivan, Ltd., have transferred all their spares activities to their premises at Dronfield, near Sheffield. All inquiries and requests for spares will now be dealt with by the newly established Spares Department at Callywhite Lane, Dronfield (telephone Dronfield 2081, telex 54/239). The transfer has provided more production space at the Cappelow factory.

Durham Raw Materials, Ltd. (1-4 Great Tower Street, London, E.C.3), and J. M. Huber, Ltd. (6 Great Winchester Street, London, E.C.2), have announced the appointment of the former company as distributors in the U.K. of materials manufactured by the J. M. Huber Corporation, 100 Park Avenue, New York 17. J. M. Huber, Ltd., will process all orders already received and contracted for, but Durham Raw Materials, Ltd., will deal with all those placed after January 1, 1958.

As from February 1, 1958, the address of the South-West Africa Co., Ltd., will be 49 Moorgate, London, E.C.2. The telephone number will be Monarch 1020. The telegraphic address will remain as hitherto: Ovambo, London.

CONTRACTS AND TENDERS

India

Under Notice No. PL/18/MACH, the National Coal Development Corporation Private, Ltd., 1 Council House Street, Calcutta 1, invites tenders for stone crushers, rotary coal drills and screen trolley cable for coal cutters. Closing date, February 3, 1958. B.O.T. Ref. E.S.B. 1701/58. Telephone inquiries to Chancery 4411, extension 738 or 771.

Book Reviews

The Porphyry Coppers in 1956, by Dr. A. B. Parsons. Published by the American Institute of Mining, Metallurgical and Petroleum Engineers, 29 West 39th Street, New York 18, N.Y.: pp. 288 with illustrations; price \$5.00 plus 50 c. postage to foreign countries.

Published on September 3, 1957, this volume supplements the author's earlier work, entitled "The Porphyry Coppers", which appeared in 1933, and brings this record of high engineering achievement up to date. The latest volume contains no detailed dissertation on technology and engineering, which are discussed in general terms intelligible to non-engineers. The result is a book which should be of particular interest not only to mining and metallurgical engineers associated with the copper industry, but also to mineral economists, financiers, brokers and investors.

The term "porphyry", as applied to copper mines, originated from the fact that the rock containing the copper at Utah Copper, Morenci, Nevada "Con", and Braden—the first four to be developed—was in each case known as porphyry.

Up to and including 1931, the twelve "original" porphyry mines produced 8,750,000 tons of copper worth \$2,820,000,000. With assistance from six others, three of which did not start production until 1954, the combined output had been increased by the end of 1955 to 30,250,000 tons worth \$10,440,000,000. Since 1940, almost half the world's supply of new copper, excluding the U.S.S.R. production, has come from the porphyry mines. Today ore is being successfully exploited that contains less than 12 lb. of copper per ton. Fifty years ago "rock" containing less than 40 lb. of copper per ton was regarded by competent mining engineers as worthless.

Apart from the much greater output, the period covered by the latest book has been marked by engineering advances of spectacular importance and by industrial and social changes that reflect the maturing of porphyry mining.

"Analar" Standards for Laboratory Chemicals. Fifth Revised Edition, 1957. Formulated and issued jointly by the British Drug Houses Ltd., B.D.H. Laboratory Chemicals Group, Poole, Dorset, and Hopkin and Williams Ltd., Chadwell Heath, Essex; pp. 397.

Before 1914, the only means by which those working in chemical laboratories could rely on the purity and homogeneity of reagents and research materials was by trusting in the reputations of a few well-known firms. Many research chemists experienced the bitter disappointment caused by the discovery that the work of many months had been rendered useless by the presence of some "alien" substance in the material used.

When the first world war broke out, it soon became apparent that the number of reagents and research chemicals actually manufactured in Britain was exceedingly meagre. In 1914, the supply of German laboratory chemicals being cut off, a joint committee appointed by the Institute of Chemistry and the Society of Public Analysts drew up specifications of purity, to which they applied the letters "A.R.", signifying "analytical reagent".

The wartime need for British laboratory chemicals was met by the strenuous efforts of Hopkin and Williams Ltd. and

the British Drug Houses Ltd. For a number of years both these firms issued their own books of specifications. Hopkin and Williams had brought out their first book as far back as 1911, while the B.D.H. book of "A.R." standards was first issued in January, 1926. A few years later, when the letters "A.R." were being brought into disrepute by the actions of some firms, it seemed desirable that the B.D.H. and Hopkin and Williams should undertake the unification of their respective series of specifications, so that a definite standard of purity should be available in Britain. The outcome was the publication in 1934 of the first edition of "Analar" Standards for Laboratory Chemicals. The word "Analar" is a registered trade-mark and is the joint property of the two firms. Each company, however, produces and markets "Analar" chemicals independently.

A number of reagents appear for the first time in the newly published fifth edition and new practices have been adopted for certain tests. The whole of the text has been carefully reviewed and many individual improvements have been effected.

Difficulties Encountered in Smelting in the Lead Blast Furnace, by R. W. Ruddle, M.A., F.I.M. Obtainable from the Secretary, the Institution of Mining and Metallurgy, 44 Portland Place, London, W.1. 56 pages. Price 7s. 6d. (5s. to members of the Institution).

This booklet is largely a critical survey of the work of Oldright and Miller contained in sixteen reports of the United States Bureau of Mines published between 1929 and 1934, and the aim has been to make more accessible the details of these reports and discuss them in the light of later experience.

The review is in three main parts: the first contains basic information on the blast-furnace operating conditions at Tooele, Kellogg and Trail smelters; the second is devoted to the formation of accretions at these smelters; and the third deals with the factors governing the lead contents of the slags. There are general discussions on accretions and lead losses, and suggestions for lines of research concerning these aspects of lead smelting.

The author was until recently head of the casting section, British Non-Ferrous Metals Research Association, and is now technical manager with Foundry Services, Inc., Columbus, Ohio.

Metalliferous Mine Surveying, by F. Winiberg. Fourth edition, revised by R. C. A. Hooper. Published by Mining Publications Ltd. Pp. 404, with illustrations and index. Price 50s.

The work under notice, originating from the late author in 1925, now reaches its fourth edition revised by the Lecturer in Mine Surveying, School of Metalliferous Mining, Camborne. Whilst the general character and arrangement of the work has been maintained—it originally purported to be the amplification of a comparatively short lecture course—various additions or replacements to previous editions have been made. In a preface, the reviser thanks Hilger and Watts Ltd., Cooke Troughton and Simms Ltd., and Hall Harding (as representatives of Henry Widd) for supplying considerable information regarding their various surveying instruments.

Metals and Minerals

More Cutbacks in Aluminium Production

United States production of primary aluminium declined last year to 1,649,013 s.tons, reports the Aluminium Association. In 1956, output totalled 1,679,247 tons. While production for the final quarter last year was lower than in October-December, 1956, the December showing was better. Aluminium output last month was 141,336 tons against 135,024 tons in the previous month and 148,391 tons in December, 1956.

Further cutbacks in production by North American producers have been announced. In Pittsburgh, Alcoa is shutting down one of its six aluminium smelter units at Point Comfort, Texas. This is in addition to curtailments in the States of Tennessee, Washington and New York, which had earlier been announced.

Surinam Bauxite, a subsidiary of Alcoa, is to cut production by 12 per cent as a result of the parent company's reduced activities.

Cutbacks in Canadian production have been announced by Aluminium Ltd. and its principal operating subsidiary, The Aluminum Co. of Canada. Aluminium Ltd. is cutting production of primary aluminium at its Canadian smelters to approximately 80 per cent of total rated capacity. The recent operating rate has been about 90 per cent. The company said that Alcan would implement the cutback by curtailing operations at its Arvida and Shawinigan plants at the end of this week.

Alcan had previously announced its intention of laying off about sixty men during the three weeks from January 17 and reducing the production capacity of its Kitimat smelter. One potline is to be taken out of regular production; half of it will be used for experimental purposes and the other half left idle. The remaining four potlines will operate normally. The curtailment is ascribed to the reduced rate of expansion of aluminium markets, as a result of the general business slowdown. So far, 977 Saguenay-Kitimat employees have been laid off, while 790 employees who have been working on two partly completed potlines have yet to be dismissed.

In Austria, the Ranshofen aluminium plant has cut back its winter production more than usual this year because of the softening of the international aluminium market. Austrian aluminium exports in the first three quarters of 1957 fell by 5,400 tons compared with the same period in 1956.

On the other hand, reports from Norway continue to be encouraging, and no cutbacks have been announced. By the end of the year, work will have been completed on the first part of the new plant which AS Elektrokemisk is building at Mosjøen, thus adding about 25,000 tons to the country's annual capacity. The greater part of the company's output for the next few years has already been sold. In addition, the State-owned aluminium smelter, AS Ardal and Sunndal Verk, is carrying out an expansion programme which will bring the capacity of that plant to 115,000 tons annually by 1960-61. Norway's two other aluminium producers, Det Norske Nitrid AS and

AS Norsk Aluminium, also have expansion schemes under way.

Japan's Ministry of Trade plans to increase the export authorization for primary aluminium in the coming 1958 financial year, starting in April, to between 5,000 and 10,000 tons. It is reported that Japanese exporters have been trying to conclude contracts with Brazil, but the amount so far earmarked for shipment to that country is small.

A timely reminder that aluminium's short-term prospects are by no means as unfavourable as the reported cutbacks might suggest is afforded by the news that more than 144,000 s.tons of this metal will be consumed directly in the manufacture of new American passenger motor cars during the current 1958 model year, as indicated by the results of an annual survey by Alcoa's Commercial Research Division. Additional amounts will be used in making replacement parts and by other industries.

This projection of usage is based on an estimated output of 5,500,000 passenger cars and on the assumption that there will be little change in the relative percentage of each individual company's share of the total industry's production. Probable aluminium consumption in the new models will amount to 52.4 lb. per average car, representing an increase of 29 per cent on last year's average figure.

U.K. USES MORE ANTIMONY

Rising production in the British motor car industry doubtless contributed to the higher United Kingdom consumption of antimony metal in November, which amounted to 430 tons compared with 396 tons in October. According to the British Bureau of Non-Ferrous Metal Statistics, batteries consumed 115 tons against 91 tons in October, antimonial lead uses other than batteries, 58 tons against 36 tons; oxide uses other than for white pigments, 80 tons (77); and sulphides, 5 tons (4). On the other hand, absorption in oxides for white pigments fell to 123 tons in November from 133 tons in October and in bearings to 35 tons from 41.

QUICKSILVER'S FURTHER GAINS

The price of quicksilver has been raised from £71 to £73 per flask ex-warehouse London, this being the third upward movement from the recent low point of £69. Now that the large offerings of Mexican metal have been absorbed, the amount of quicksilver coming forward is relatively small.

Nevertheless, it remains to be seen whether the London price will go much higher. In the United States, the price of quicksilver for domestic delivery has been cut to \$220-\$225 per flask from the previous level of \$223-\$228, to which it had been reduced as recently as January 14 (from \$225-\$230). Deliveries under

the United States programme for domestic and Mexican producers are being delayed by GSA's insistence on seamless flasks, which are not normally used. The United States Government has the power to absorb the current surplus, which has been privately estimated at 60,000 flasks a year, but due to the difficulty in obtaining seamless flasks, it may do so comparatively slowly. Meanwhile, further easing in New York might well result in renewed offerings of Mexican metal to the United Kingdom.

Mercurio Italiano, the recently reconstituted joint selling agency, comprising Monte Amiata and Siele, is now officially functioning. Roura and Forgas Ltd., of London, who were agents for Amiata, Italy's largest producer, have been appointed the sole selling agents for the new concern in the sterling area and Western Germany. Mercurio Italiano is reported to be offering quicksilver at £80 per flask f.o.b.

WOLFRAM STOPS DRIFTING

After the long downward drift, wolfram ore shipment prices in London are at last showing perceptible signs of hardening. Although the total weight of demand still leaves much room for improvement, it appears to have broadened during the past few days. Moreover, Bolivian material, which for some time past has been pressing on the market, is reported to be less in evidence. At the time of writing, a price range of 91s. to 97s. per 1-ton unit c.i.f. Europe is indicated for standard grade material, compared with 91s. to 96s. previously.

Whether wolfram will now stage a sustained recovery is an open question, but it is evident that, sooner or later, the fall in production caused by the prevailing low prices must eventually bring about a radical transformation in the supply-demand picture; more especially if the recession in the United States proves as short-lived as the predictions of the more optimistic economists suggest.

OUTLOOK FOR CHROME ORE

According to trade sources in London, a certain amount of buying interest in chrome ore is being shown by the Continent, the United Kingdom and the United States, but for the next two or three months the general level of demand is expected to be rather subdued. In the United Kingdom, and presumably in some other countries as well, buyers are said to be in the process of reducing their stocks. Certainly in the United Kingdom, the 7 per cent Bank Rate is hardly an inducement to hold greater stocks than is consistent with safety. Moreover, steel production in the United States might well remain for a while at the lower level to which it has latterly fallen, and any setback in the stainless steel section, however temporary, could scarcely fail to affect the ore position.

Ore supplies appear to be more than

adequate for the present unimpressive demand, and it is difficult to envisage any recovery in prices until conditions change. The possibility cannot be excluded, however, of some improvement in demand for the second quarter of this year, following the erosion of buyers' stocks. Even so, if supplies continue to be freely available, the price structure is unlikely to be materially altered.

During 1957, Turkey exported chrome ore worth about £163,000,000 to the United States, the United Kingdom, West Germany, France, Italy, Austria, Sweden and Norway. About £128,000,000 worth was high-grade material.

Under a Japan-Soviet Trade Pact signed at Tokyo in December, 1957, the Soviet Union will export 20,000 tons each of chrome and manganese ore to Japan during the current year. In order to avoid "unnecessary competition" among importers, the leading Japanese ferro-alloy makers have designated four Japanese firms to take concerted action for imports of chrome ore and manganese ore under the agreement. The Japanese industry is reported to be concerned at the growth in stocks of chrome ore, due to the sharp decline in domestic requirements for special steel manufacture. Local trade sources estimate stocks of ore held by the four leading ferro-chrome makers at between 55,000 and 58,000 tons. In addition, 30,000 tons will shortly arrive from the Philippines under a long-term contract.

TANTALUM IN DEMAND

BDSA reports that the outlook for the United States tantalum market in 1958 is for a much larger supply of capacitor grade metal, due to expanded facilities of

present producers and to full-scale output by three or four companies which have been producing on a pilot-plant scale. In view of the renewed emphasis on the missile programme, the demand for tantalum capacitors—which depends largely on military requirements—is expected to reach record proportions. Moreover, it is believed that because of the increased supplies available, additional uses of tantalum for both military and civilian purposes will be developed.

The outlook for the columbium market in general is also regarded as favourable. This view is based on the high-temperature characteristics of the metal, which are of major importance in connection with the missiles, aircraft and atomic energy programmes.

U.S. SULPHUR INDUSTRY

The United States demand for sulphur, a traditional barometer of industrial activity, declined slightly in 1957, but remained near the record peak established the previous year. In an annual review of the industry, Mr. Langbourne M. Williams, president of Freeport Sulphur Co., pointed out that the use of sulphur reflected the levelling off of business experienced by the major consuming industries such as steel, fertilizer, chemicals, paper, pigments and rayon.

Consumption of sulphur in all forms in the United States, according to preliminary estimates, was about 5 per cent lower than the record 5,780,000 tons consumed in 1956. Experts were estimated to be near the 1956 peak of 1,650,000 tons. The total output of sulphur from all United States sources amounted to an estimated 6,900,000 tons, compared with 7,820,000 tons in 1956. Frasch sulphur alone accounted for 5,500,000 tons.

sider the price structure, but as this was subsequently proved to be erroneous the price recovered on Monday and over the week there has been very little alteration. The main talking point is, of course, the likely outcome of the deliberations of the Tin Council, and by the time this is read the communiqué will most likely have been issued and it is, therefore, valueless to discuss the various rumours which are circulating. Sufficient to say that the general opinion is that the Tin Council cannot permit the scheme to fail at this juncture, as most informed opinion believes that within a relatively short period of time the existing export cuts will be reflected in a higher price.

The stocks in the U.K. last week showed a very much smaller rise than was expected, and the latest figures issued of the shipments from Malaya indicate that the tonnage of metal which will have to be taken up by the buffer stock is diminishing. There have been rumours that the final buffer stock quota has been called up, but there is still some doubt about this although well-informed opinion in London is that the buffer stock now has the 15,000 tons which are necessary before this can take place. On Thursday morning the Eastern price was equivalent to £732½ per ton c.i.f. Europe.

FIRMER LEAD-ZINC MARKETS

The lead and zinc markets have both developed a further undertone, the former due to continued demand for the metal for prompt shipment to America and the latter on the growing realization that present prices make the shipment of raw materials unremunerative. This was borne out by the announcement that the Australians confirmed on Wednesday that the railing for shipment overseas of zinc concentrates from both the Zinc Corporation and New Broken Hill had ceased. Also, with every week that passes, some people are beginning to believe that the recommendations made by the U.S. Tariff Commission are likely to be less severe than was at one time thought, owing to opposition from Mexico, South American countries and Canada.

Consumption of both metals in the U.K. and Europe remains at a very good level and as zinc producers are no longer so anxious to sell their metal and as prompt lead is not available in large tonnages, any demand elsewhere in the world will have an immediate reaction on the price.

Closing prices and turnovers are:

| | Jan. 16 | | Jan. 23 | |
|-----------------|------------|---------|------------|---------|
| | Buyers | Sellers | Buyers | Sellers |
| COPPER | | | | |
| Cash | £172½ | £172½ | £166½ | £165½ |
| Three months .. | £174½ | £175 | £168 | £168½ |
| Settlement .. | £172½ | | £165½ | |
| Week's turnover | 8,850 tons | | 8,000 tons | |
| LEAD | | | | |
| Current ½ month | £70½ | £71 | £72½ | £72½ |
| Three months .. | £71½ | £71½ | £72½ | £72½ |
| Week's turnover | 3,725 tons | | 3,100 tons | |
| TIN | | | | |
| Cash | £730 | £730½ | £730 | £730½ |
| Three months .. | £713 | £714 | £713½ | £714 |
| Settlement .. | £730½ | | £730½ | |
| Week's turnover | 2,810 tons | | 2,465 tons | |
| ZINC | | | | |
| Current ½ month | £61½ | £61½ | £62½ | £62½ |
| Three months .. | £60½ | £61 | £62 | £62½ |
| Week's turnover | 7,375 tons | | 4,875 tons | |

London Metal and Ore Prices appear on page 120.

COPPER • TIN • LEAD • ZINC

(From Our London Metal Exchange Correspondent)

During the week under review the tendency for copper has been downwards, whilst slightly better demand for lead and zinc has caused a rise in the level of prices. The tin situation still remains unclear and overall quotations show little difference in spite of a break in the market last Friday.

COPPER BALANCE RESTORED?

The copper market has once more been the centre of interest owing to the weakness of the price structure in America which resulted in a reduction in the customs smelter price to 24 c. per lb. on Tuesday. In some people's opinion, the major item of news during the week was the further reduction at the Arizona property of the Phelps Dodge Corporation, which means that world production cuts now announced amount to almost 250,000 tons a year. Although it is admitted that a number of new properties have come into production and other smaller properties have increased their rate of production, overall the balance between production and presumed consumption during 1958 has now been brought in line. The only important copper producers who have not yet announced any definite cutback are the Rhodesian Anglo American

Group, but in their case it is believed that a reduction has in fact taken place through the cutback of development projects.

Although there may be further weakness in the copper market in the near future, it now begins to look as if an upturn in price is likely to take place some time during the second quarter of the year, and if this is so then the prospects for the remainder of the year are relatively bright. The latest statistics issued by the U.S. Copper Institute are for December. These reveal that domestic deliveries during the month showed a further decline of some 22,000 tons and a rise in stocks of a corresponding amount. For countries outside the U.S., deliveries were down some 14,000 tons and stocks increased by almost an equivalent amount. These figures are very disappointing, as many experts had hoped that output would have shown an appreciable fall whilst deliveries would have remained fairly constant.

TIN COUNCIL MEETS

The tin market was disturbed on Friday by reports from Belgium that the meeting of the International Tin Council, starting on January 22, was to con-

Mining Finance

Oil—The Catalyst of the Platinum Market

It is not very often that a chairman of a mining company is in a position to speak with irrefutable authority on the world outlook for the product his company produces. This somewhat unusual position is held by Mr. D. A. B. Watson, chairman of Rustenburg Platinum Mines.

The platinum industry is small, South Africa, Canada, and the U.S.S.R. are the only three major producers, and ex-U.S.S.R., Rustenburg Platinum Mines has been the world's largest producer of platinum metals since 1953, which incidentally has enabled South Africa to oust Canada from the position of leading suppliers.

Mr. Watson's statement to members of Rustenburg Platinum Mines (the full text of which appears on page 112 of this issue) should therefore be read with care by all those interested in platinum, either from the standpoint of the Stock Exchange or the Metal Market.

Essentially, the chairman of Rustenburg Platinum is concerned with the present and future demand schedules for platinum by the oil industry. This is so because any recovery in the platinum price depends on the oil industry re-entering the market in some strength. While it is known that various oil-refining companies have within the past six months withdrawn from the market some two to three years before their stated inventory requirements have been satisfied, whether they will return to the market in the near future is unknown. Moreover, when they do, the crucial question is whether they will opt for a platinum catalyst containing only 0.3 per cent platinum in preference to the alternative type containing 0.6 per cent platinum. It is quite obvious that if the oil refiners choose the lower-grade catalyst, the impact on near term demand could be marked. From the tenor of Mr. Watson's remarks on this point, it would appear that the final choice is still in the melting pot.

The slowing down of demand from the oil industry and from other industrial users is also, of course, a function of the industrial recession now in evidence in most countries. But how far and to what extent the same pattern of demand will return when industrial production curves are once more in the ascent is still unanswered.

Another point (an imponderable, in so far as it is beyond Free World producers to control) is the flow of supplies emanating from Russia at a price about £1 an oz. cheaper than the current market price. At present there is no sign of supplies from this source diminishing, so that, all in all, there is little Mr. Watson can find to relieve the sombre outlook.

However, taking the long-term view, it is his opinion that "The gradual growth in demand for industries other than oil refiners which has continued over the past twenty years will continue in future years".

ASHANTI LOOKS CHEAP

It has never been difficult to be bullish about the outlook for Ashanti Goldfields, as the mine, for its size, is probably the richest gold mine in the world.

Yet the restriction scheme introduced during the war, and the subsequent political upheavals in Ghana epitomized by the coming to power of Kwama Nkrumah, the unstable labour position reflected by the non-co-operation of the unions, and the relatively high rate of capital expenditure by the Ashanti Gold Fields Corporation to reorganize and re-orientate its underground layout and production to take the best advantage of the new Eaton Turner shaft system, have all contrived to put "West Africans" out of favour with the investing public for some years.

Indeed it is unfortunate that, on the political front, investors have not yet quite appreciated the fact that Mr. Nkrumah was able to effect a bloodless transformation of the country's status from a Colony to a Dominion in little more than four years. Fringe repercussions to this startling achievement are still with us, but it is about time that it was realized that the overall position in Ghana today is far from explosive and, in fact, a great deal better than in many other countries where the political risk is wilfully looked at from the wrong end of the telescope. The difficulties connected with the labour unions can be described quite happily as a function of immaturity rather than of deep-seated strife, and this important aspect of the background to investing in Ghana should gradually resolve itself into creating a more favourable investment climate.

With regard to Ashanti itself, the capital expenditure programme has now fallen away to unimportant levels, and the mine is in as fine a fettle as it has been at any time in its career. The preliminary profit statement issued this week amply bears out this statement, showing as it does net earnings for the year ended September 30, 1957, at £747,811, which compares with £216,271 in 1956. This comparison, showing a profit rise of more than £530,000, suffers from the fact that 1956 had to bear the brunt of the fourteen weeks' general strike in Ghana. But even so, the latest profit figure is still in a class by itself when held up against the free balance obtained in 1955 of £476,445 and £353,616 in 1954. More than that, the 1957 figure was struck after providing £580,000 for taxation, and enabled the Corporation to not only raise its total distributions for the year to 1s. 10d. per share against approximately 1s. 4½d. per 4s. 0d. share in 1956, but also permitted £42,000 to be allocated to prospecting reserve, £200,000 to general reserve—both allocations going against nil in 1956—a repeat transference of £50,000 to Fixed Assets Replacement Reserve, and still left enough over to

strengthen the carry-forward by some £50,000 to £383,827.

Judging from the exceptionally good development results obtained on the lower levels over the past twelve months and the absence of any underground difficulties, investors would do well to keep an eye on Ashanti during the coming year—it could pay off handsomely.

In connection with Bibiani, the preliminary profit statement showed a welcome recovery in earnings over 1956. Accordingly, the company has returned to the list of dividend payers with a total distribution of 10 per cent which was last paid in 1954, the dividend in 1955 having been reduced to half that amount.

Major-General Sir Edward L. Spears is chairman of both Ashanti and Bibiani.

APEX SOUNDS A WARNING

At yesterday's annual meeting of Apex (Trinidad) Oilfields, the chairman, Mr. F. R. Cottell, had familiar words to say on two familiar subjects.

The year covered by his review had brought excellent results to the company, in spite of rising costs. However, Mr. Cottell said, were the present slight recession in oil prices to continue, particularly if accompanied by further rises in costs, both productive and exploratory work would be seriously hampered. On taxation, Mr. Cottell declined to comment on the proposed adoption in Trinidad of the Venezuelan "50-50" profits division formula. But he pointed out that for some years past, royalty and taxation payments in Trinidad have amounted to some 46 per cent of the company's taxable income.

Extracts from Mr. Cottell's speech can be read on page 114.

GOLDEN IRONS IN THE FIRE

St. John d'El Rey, which has experienced a sharp rise in the market over the past fortnight, has now issued a statement saying that the company's manager in Brazil understands that the Brazilian Government Commission set up to study the gold mining industry problem with a view to finding a solution calculated to relieve the company of its present economic and financial difficulties brought about by recent substantial wage increases and the fixed price of gold, has now recommended the company to be granted (as from November last for a six-month period) a subsidy based on cost of production plus allowance of £60,000 per annum for depreciation. Amortization charges due to the Banco do Brasil are excluded.

At best, this will do little more than keep the company in production and, presumably, free from monthly losses. However, the important point is to keep

the mine and the company viable, for it is generally felt to be true that the iron ore deposit on the company's lease area is wanted by American interests. This has been known for some time but exactly who the U.S. interests were was not known. Now it is revealed that it is the M.A. Hanna Co. which already has a substantial holding in the company and has strengthened further its interest by taking an option on a "substantial percentage" of the holdings owned by Mr. Leo Model.

It will be recalled that rumours of negotiations for the iron ore deposits were very current last year around this time. This can now be put down as fact. Furthermore, the shares last year went up over £4 and if the deal comes off and M.A. Hanna Co. are prepared to take over the iron ore deposits the shares will certainly go at least as high again. On gold considerations alone it would be difficult to raise the price at which St. John d'El Rey would be an interesting market attraction.

OFSETS AND WRITS PAY MORE

Three finance houses in the Anglo American group have announced their final dividends for the year to December 31, 1957. Ofsets, interested mainly in the new mines of the O.F.S., show an increase of 100 per cent over the 1956 maiden, the final distribution of 2s. per share making 3s. for the year against 1s. 6d. The increase is amply justified by estimated net earnings, which almost doubled from £742,810 in 1956 to £1,399,000 last year. Writs, which also has a portfolio of young gold producers, is also increasing its payment, in this case from a total of 2s. in 1956 to 5s. in 1957 including a final of 2s. Amits' diamond interests, on the other hand, have only made possible the maintenance of the 1956 total of 20s., the final payment in this case being 10s. plus a bonus of 2s. 6d.

HARMONY'S HIGH URANIUM VALUES

The remaining December quarterly reports have now made their appearance since last week's issue.

Of these, the report from Harmony was outstanding. This company's new shaft intersected the basal reef, obtaining gold values averaging 2,248 in. dwt. and uranium values of 88.72 in. lb. Stopping out the reef for a distance of 15 ft. round the shaft gave an average yield of 2,127 in. dwt., and the exceptionally high uranium value of 107.87 in. lb. Actual gold results obtained from development, however, were down from the September quarter. Blyvoor's values from gold development were somewhat disappointing, as were those of Crown Mines. A point of interest is that in future Harmony and Blyvoor will publish profits from uranium, pyrite and sulphuric acid monthly instead of quarterly.

Gold mines in the Gold Fields group generally maintained their progress, with West Drie still chalking up 100 per cent payability and Doornfontein returning higher gold values and payability of over 90 per cent.

Buffelsfontein in the General Mining group continued to go from strength to strength, the December quarter showing 98 per cent payability averaging 625 in. dwt. against 95 per cent payability and 570 in. dwt. This company's uranium

profits continued to rise, as did those from Stilfontein which company, however, experienced a setback in its gold earnings.

Hartebeestfontein in the Anglo-Vaal group announced quarterly results somewhat below those obtained in the previous quarter. This position was reversed in the case of Virginia, which also announced a big increase in its ore reserves. The December quarterly returns from the companies in the "Johnnies" group featured a marked increase in the ore reserves of Freddie's Consolidated, whose gold values were considerably higher—428 in. dwt. against 376 in. dwt.—but this was achieved over a smaller footage sampled and reduced percentage payability.

WITBANK TAKES TO THE ROAD

For some time now, the two main difficulties of the S.A. coal industry have been lack of transport and lack of native labour. Witbank Colliery has not been exempt from troubles in these directions and, although the latter of them is now so chronic as to appear almost incurable, this company is making a brave effort to at least alleviate the former.

In his circulated statement as chairman of the company, Mr. T. Reekie reveals that in recent months Witbank has been despatching as much as 300,000 tons a month by road haulage to consumers within a 120-mile radius of the pithead. However, this can be no more than an interim measure for obvious economic reasons, and there is no doubt that the S.A. railway administration will ease any mine manager's worries when it puts into effect the two planned schemes for the improvement of coal haulage from the Witbank-Middleburg coalfield. These schemes encompass the laying of a third line in the sections between Delmas and Eloff and Abor and Argent, both on the Rand-Middleburg main line, which at present carries more coal than any other line in the Union, and the eventual electrification of the whole Witbank/Rand system.

JOHN SUMMERS' EXCELLENT RESULTS

The year's results of John Summers and Son, one of the smaller of Britain's iron and steel giants, have a claim to being if not unique, then certainly very unusual, in that they appear to be well-set to please everybody.

Even the nationalization bogey, which must be disturbing the sleep of more and more steel company chairmen daily in direct proportion to the government's majority in recent by-elections, is not sufficient to cast a real shadow over the company's prosperity. What is more surprising still is that these results were achieved in a year when the general trend of business was downwards. In spite of new credit stringency and the restriction of car imports into some Dominions, both of which led to a lessening of the home demand for John Summers' steel, there was no short-time working—in fact production rose—and in spite of the increased cost of materials, services and labour, the trading results were an improvement on the preceding year.

Extracts from Mr. Richard F. Summers' address as chairman appeared on *The Mining Journal* last week. The annual meeting will be held in London on February 5.

MARKET HIGHLIGHTS

There was little sign of a break in the clouds, currently overhanging mining share markets, in the week ended January 22.

The Kaffir section continued on the steady downwards course which has persisted for over a fortnight and not even the appearance of some encouraging quarterly reports could stem the trend. Admittedly, Harmony rose from 30s. to 31s. for a while on the further high gold and uranium values from the new No. 2 shaft but the improvement in price was short-lived.

Particularly weak were Free State Geduld new shares, which, under the influence of heavy Cape Selling, changed hands down to only 9d. premium; there was a later rally to around 1s. 6d. but it could have brought little comfort to those who had paid over 5s. as recently as a fortnight before. F.S.G. "old" fluctuated rather unhappily at around 78s. 9d. and since the new issue is priced at 80s., this made even a price of 1s. premium for the new shares look expensive.

Another weak spot was in Buffelsfontein, where talk of a major upthrow fault being encountered and necessitating a new shaft system caused a fair amount of selling. Official denials from Buffels that the position underground would require any major change in mining policy eventually brought a rally in the shares from 35s. 7½d. to 36s. 9d. Hartebeest came back in sympathy to 57s. 6d., before later recovering to 58s. "Ofsets", reflecting the general trend, fell to 54s. 9d. in front of the dividend announcement.

Diamonds were fairly steady, but Platinum shares took a nasty knock following the passing of interim dividends by Rustenburg and consequently the holding companies also. Potgietersrust dropped 9d. to 5s. 6d.; during the past 12 months or so they had reached 17s.

Base-metal shares tended to drift in the wake of the receding metal prices. Copper shares generally lost further ground in subdued trading and in Lead-zincs, New Broken Hill (34s.) and Consolidated Zinc (50s.) were not helped by news that concentrates were to be stockpiled as a result of low metal prices.

A sudden and generally unexplained wave of Singapore selling hit the Tin share market on Monday. But like a summer storm it quickly passed, leaving the market rather bewildered. There was, however, no later recovery in prices apart from a rise in Beralit to 26s. 6d. on the improvement in wolfram.

One of the very few bright spots was the sudden revival in St. John d'El Rey following encouraging news from Brazil concerning the mine's gold and potential iron ore operations. The shares, which when they move leave a metaphorical spurt of dust in their wake, jumped from 48s. 9d. to 60s. before reacting on second thoughts to 56s. 3d. Another stock famed in the past for its ready response to news, Consolidated Murchison, fell a shilling or so to 22s. 6d. on the December quarter's working loss.

Elsewhere, the anticipated increase in Ashanti's final dividend was announced and the shares eased slightly to 13s. 9d. on profit-taking.

Financial News and Results

One-For-Six and 9½d. For C.M.F.S.A.

—All assets of Central Mining Free State Areas except the holding of Harmony have now been disposed of, and the liquidators have announced a first and final distribution to be made free of non-resident shareholders' and U.K. income taxes. The distribution will consist of one Harmony share for every six C.M.F.S.A. held, fractions being valued at £1 10s. 10½d. per share, and a little more than 9½d. per share in cash.

New Modder Sells Out.—Remaining assets of New Modderfontein Gold have been sold, subject to certain suspensive conditions, to Mr. Robert Horowitz, the purchaser in March last year of other assets of the company, for the sum of £100,000.

Dominion Reefs' Quarterly.—Although Dominion Reefs increased their working profit in the December quarter to £201,996 from £194,647, development results showed a sharp reduction, payability dipping from 72 per cent to 39 per cent. However, values improved slightly from 1.27 lb. over 40 in. to 1.39 lb. over 38 in.

Waverley Earns More.—Waverley Gold Mines announce a working profit in the quarter ended December 31 of £3,562. This compares with £744 in the preceding period.

Seremban.—In the year to June 30, 1957, Seremban earned a net profit of £191 after tax, a decline from £236 in the previous year. Owing to the security position, mining is being carried on only spasmodically.

Bad Quarter For Burma Mines.—Reduced metal prices and lower sales combined to turn a profit of £1,875 after depreciation into a loss of £19,777 for Burma Corporation (1951), jointly owned by Burma Mines and the Burma Government, in the quarter ended September 30 last. The full results for the quarter appear on page 116.

Reduced Quota For Amalgamated Tin.—Amalgamated Tin Mines of Nigeria announce that their permissible export quota for the first period of tin restriction is 708 tons, and not 723 tons as previously stated. These quotas include the allowances of Keffi Tin and London Nigerian Tin.

Buffels Deny Rumours.—Rumours recently in circulation regarding the technical position at Buffelsfontein Gold, which essentially implied that unexpected faulting had upset the company's policy, are emphatically denied by the company. Such faulting as has been encountered, the statement says, was fully covered by the existing mining and financial programmes. In particular, there was to be no change in the shaft-sinking programme.

More To Come From Taquah And Abosso?—At the meeting this week of Taquah and Abosso Mines (in liquidation), it was stated that further income is anticipated from the sale of the remaining powerhouse plant and iron scrap. No estimate can be made as yet of the total sum that these items might raise.

New Cementation Subsidiary.—In the course of establishing O.T.C. status, Cementation has registered a new company, Cementation Co. (Overseas).

(Continued on page 113)

WESTMINSTER BANK LIMITED

INCREASE IN DEPOSITS

The Annual General Meeting of Westminster Bank, Ltd., will be held on February 12 in London.

The following are extracts from the statement by the chairman, **The Right Hon. Lord Aldenham**, circulated with the report and accounts for the year 1957:

The Accounts for the year show a decrease of £12,569 in our profits. There have been a number of factors affecting our income and outgoings, among them two Bank Rate changes, but our trading result has been mainly influenced by the increase in our Staff costs.

A Satisfactory Result

Our Current, Deposit and Other Accounts have risen by over £30,000,000. This is a satisfactory result, particularly as stringent monetary measures have been in force throughout the year, and as institutions other than the large Commercial Banks have continued to advertise for Deposits at very high rates.

Advances have decreased, reflecting the expected pattern in a year in which the credit squeeze has operated throughout and has been reinforced by the Chancellor's Statement in September and by higher borrowing rates. The amount we earned in our Loans and Overdrafts was only moderately higher than the comparable figure for the previous year, as the higher interest rates ruling during the last three and a half months were accompanied by a decrease in Advances.

The deficiency in the market value of our British Government securities was rather greater at the end of 1957 than it was in December, 1956, but all our Government securities are dated, and the great majority will mature within the next few years.

Our largest single item of expenditure—payments made to or for the benefit of our Staff—has risen again, despite the fact that we have added but a few to our Staff numbers.

You may be interested to learn a little about the Staff Associations in this Bank. The Guild, established in 1919, enjoys a 70 per cent membership of the total of our active clerical Staff. Its elected representatives, who come along to Head Office on a variety of problems, speak with a great weight of opinion behind them. The Non-Clerical Staff Association, which was also founded in 1919 and had a membership of 71 per cent, has the same facilities for coming to Head Office in order to discuss its problems.

Drain on Reserves

The blocking of the Suez Canal was believed a year ago to be a much more serious threat to the economic position of this country than, in fact, it proved to be. In the first six months of 1957, almost as much was added to our gold and dollar reserves as had been added in the first six months of 1956. But in July last the position changed very rapidly, and July, August, and September saw a drop of £189 million in those reserves. The fundamental cause of the drain on our reserves was the widely held belief that those reserves are quite inadequate to support the value of the pound sterling. Other causes of the fear of devaluation of sterling were the reappearance of the dollar gap, the great and growing improvement in the West German balance of payments, the devaluation of the French franc, and the constant deteriora-

tion in the purchasing power of the pound at home.

On September 19, drastic action was taken by the Bank of England and by the Chancellor of the Exchequer. These unpleasant and expensive remedies need never have been so severe if remedial action had been taken earlier. From the very beginning of the credit squeeze in July, 1955, the banks have made it abundantly clear to the Government that the credit squeeze by the banks without complementary action on the Government side would not be sufficient to halt inflation.

Industry and Public Expenditure

The limit set for investment by the public sector is £1,500 million per annum for each of the next two years. It is surprising to hear that the expenditure of this vast sum has in some quarters been called an investment freeze; rather is it puzzling to know how the money is to be found without further inflation.

If the future claims of private industry and of the Commonwealth are to be met, it seems that the Chancellor will have to set his sights for public sector capital expenditure rather lower than £1,500 million per annum.

Last September, the Government asked the banks to keep the coming year's average level of advances down to the average of the preceding twelve months, and the banks have agreed to try, though it will be unprofitable to us and difficult to achieve. If we do achieve it, I see no reason why we should not subsequently get back to more free competition amongst ourselves.

Importance of a Stable Pound

A most important declaration was made by the Chancellor of the Exchequer in October that "a stable pound is the prerequisite of full employment"; and it would seem that there is a growing acceptance in the country of the view that it is more important to us all to have a stable pound than to have conditions of artificial boom created by inflation. Certainly it is more honest to our creditors abroad.

We are, and have been, spending a larger proportion of our national income on consumer goods, and a smaller proportion on research and improvements to our factories, than have our principal competitors in the export markets. A further danger to our competitive position lies in the fact that our costs per unit of output have increased in the past few years more rapidly than those of West Germany and the United States.

These two considerations may help to explain why our percentage share of total world trade has each year for the past seven years been declining. This fact has been masked by the growth in total world trade, but it will become of increasing importance if in 1958 there is some contraction in the total volume. We cannot ignore the possibility of some contraction under the influence of the recession in North America, and the diminution of income of primary producing countries.

At the beginning of 1958 three main anxieties remain with us, the maintenance of world peace, the stability of the purchasing power of the pound sterling, and the continuance of our ability to compete in price and quality in the export markets of the world.

RUSTENBURG PLATINUM MINES LIMITED

(Incorporated in the Union of South Africa)

Statement to Members by the Chairman, Mr. D. A. B. WATSON, on the Directors' Report and Accounts for the Year ended August 31, 1957

(Issued to Members prior to the Twenty-Sixth Annual General Meeting to be held in the Board Room, Consolidated Building, corner of Fox and Harrison Streets, Johannesburg, on Thursday, January 30, 1958, at 9.15 a.m.)

The Report of the Directors for the year ended August 31, 1957, reviews in detail the operations of the company during that financial year. Trading results were satisfactory, sales of platinum and by-product metals exceeding those of the previous year. Net revenue before tax amounted to £4.48M., which was £1.26M., or nearly 40 per cent, greater than that earned during the previous year.

The appropriation from current profits towards meeting capital expenditure incurred during the year was £224,000. The appropriation to the Stock Realization Reserve to finance increased stocks of metal in transit in treatment and in a refined state amounted to £895,000, and the appropriation to General Reserve to finance the increase in the value of stocks of stores and materials was £73,000. The cost of the increase in pipeline and refined stocks of metals and in stores and materials during the past two years has been £1,185,000. An amount of £1.9M. was distributed in dividends during the current year.

The technical programme for the period was carried out as planned and by September, 1957, the mines were in a position to mill at the increased rate of 2.6 million tons per annum as provided for by the 1956-57 expansion programme.

The shortage of platinum which had prevailed during 1955 and 1956 continued into the early months of the calendar year 1957. Up to the end of February, 1957, marginal supplies of the metal on the open market were commanding prices above the official price quoted by the major platinum refiners. By July demand showed signs of slackening, but it was only three months later, in October, that it became clear that a complete reversal in market conditions was taking place and that the world over-supply of platinum had reached serious proportions. Steps were taken at your company's properties to reduce the current scale of operations to a rate commensurate with the then estimated market requirements for platinum. During November and December, 1957, the position deteriorated further and another and material reduction in the rate of production on the mines was arranged. Members have been advised from time to time by the Board of these changes and of the action taken to meet the changed circumstances. The steep decline in the demand for, and the fall in the price of, platinum during the second half of the calendar year and the consequential adverse effect on the affairs of the company were very considerably greater than had, in August, been regarded as likely from the information then available.

THE PLATINUM MARKET

Demand:

The reduction in demand for platinum has up to the present arisen mainly from the drastic curtailment and, in certain cases, the complete withdrawal of orders placed by oil companies for platinum for use in the platforming process, while re-

cently there has also been some hesitancy on the part of other industrial users. It appears likely that the recent reduction in requirements by all users is largely the result of the economic uncertainty arising from the industrial recession which has developed throughout the world and which has led to a hesitancy on the part of users to proceed with capital programmes and to decisions to carry lower stocks for the time being. There has been, furthermore, a recent trend towards the use by the oil industry of a platinum catalyst containing only 0.3 per cent platinum in preference to the alternative type containing 0.6 per cent platinum and this has had a material bearing on the current reassessment of that industry's requirements. It is a moot point, however, whether the current trend towards the use of the lower-grade catalyst will continue; informed opinion is by no means unanimous as to the relative merits of the two forms of catalyst. Members will appreciate the considerable difference the eventual adoption of one or other of these types of catalyst will have upon the demand for platinum.

Prior to embarking upon the recent expansion schemes, exhaustive inquiries were made as to the potential requirements of individual oil-refining companies over the five years 1956 to 1960. The figure for such estimated requirements was such as to justify fully the expanded rate of production. In point of fact, various oil-refining companies have within the past six months withdrawn from the market some two to three years before their stated inventory requirements have been satisfied.

Price:

As stated, the demand for platinum continued to weaken after the close of this company's financial year and the open market price of the metal moved steadily to lower levels. To meet the competition arising from the prior reductions in the prices quoted by our competitors, the official price of the company's platinum was reduced in two stages during the last three months of the calendar year from the price range of £33-£34 to a range of £27 10s.-£28 10s. per oz., which is the same as that which ruled throughout the major part of the year 1955.

The weakening in price has been caused principally by the very considerable fall in demand as a result of which platinum has been in free supply. Offerings from Russia have continued and, being made in a competitive market, have been at prices lower than those quoted by your company and the other suppliers of platinum of non-Russian origin. Some platinum which had been used as a medium in certain currency transactions has also appeared on the market at similar prices.

The open market price, which is being set mainly by the level at which Russian supplies are offered, is now about £1 per oz. below the present official price range. There is at present no indication that offerings from Russia are diminishing nor of any change in their policy of selling platinum below the official price quoted by the main suppliers of the Western world.

The reduction in the official price of platinum by £5 10s. per oz. during the

current financial year has, of course, made serious inroads upon the profit margin of the company. In our opinion, the profitability to a primary producer of the platinum price of £34 per oz., which this company had maintained throughout the greater part of 1956 and 1957, was reasonable and commensurate with the capital invested in the assets of the company, and the large working capital required to finance the necessary considerable stocks of metals in transit and in treatment at the refineries.

In pursuance of our policy of attempting to maintain a steady level of the platinum price, we did not, in July of this year, immediately follow the downward movements which were initiated by the unofficial quotations and followed by our main competitors. It is in the long-term interests of both producers and consumers to avoid, if possible, the disturbances caused by rapid fluctuations in price in either an upward or downward direction, and it was decided that Rustenburg's price should be maintained until it could be seen whether Russian offerings were likely to continue in the face of a falling price. These did, in fact, continue at gradually reducing prices and, in order to maintain our competitive position in world markets, the price of Rustenburg metal was reduced in October, 1957, and again in December, 1957.

SALES AND PRODUCTION

Sales of platinum by your company during the first four months of the current financial year amounted to little more than 50 per cent of the average monthly sales during the financial year ended August 31, 1957. There is no indication at present of any improvement in the position.

The completion of the various expansion schemes at the Rustenburg and Union Sections provides the opportunity for considerable flexibility in planning operations. The current scale of operations will, if necessary, be further adjusted from time to time to provide for such changes as may occur in the platinum market, and such adjustments will be made with due regard to the desirability of maintaining this present flexibility.

Reductions in the scale of operations on the mines have unfortunately necessitated the retrenchment of some 650 Europeans and 5,000 Natives since October, 1957. Every effort has been made to minimize the hardship caused by these retrenchments, but the effect on individuals and on the neighbouring districts has been severe.

PROSPECTS OF THE COMPANY

It is not possible at this point of time to make a reliable estimate of trading results for the current year. Any such estimate would have to be based on factors which may change rapidly and materially during the remaining eight months of the financial year.

Net capital expenditure during the year will amount to approximately £400,000, which represents expenditure on such work connected with the 1956-57 expansion scheme as was in progress at the end of August, 1957, notably in respect of housing and of improvements to the smelter plant, which work was too far advanced to be stopped. If produc-

tion remains at its present low level, capital expenditure in the financial year 1958-59 and for several years thereafter will be negligible. If it should prove that a material increase in the present rate of production is justified, certain expenditure on shaft-sinking and sundry other items will become necessary at that time. The Directors' Report for the financial year ended August 31, 1957, made it clear to members that, in addition to providing for current capital expenditure of some £400,000, provision will also have to be made for the sum of £1.7M. outstanding at August 31, 1957, in respect of past capital expenditure. When deciding upon the amount of dividend to be paid in August, 1957, the Board anticipated that the amount required to finance past capital expenditure could be met from profits during the next two years, while at least maintaining the 1957 rate of dividend. As a result of the material changes in the immediate prospects of the company which have taken place since August, the profits earned will be insufficient to carry out this anticipated programme. The period over which appropriations necessary to meet the deficit on capital expenditure will be made will be reconsidered in the light of current profits and of the Board's assessment of the future level of profits from year to year. It will be necessary to give careful consideration to the proper balance between the magnitude of such appropriations deemed prudently necessary to extinguish the deficit in the financial position and the desirability of providing some return to members meanwhile. It is too early to come to any conclusion as to where this balance will lie for the current year.

As I have already stated, the present extensive cut in mine production took place some months after the beginning of the current financial year and mine output will exceed to some extent the present anticipated sales for the year. The cost of producing these additions to stocks which have arisen during the first few months of the financial year will have to be financed. Every effort is being made to regulate production as rapidly as possible to a point where the minimum additions to stocks will result. It is at present expected that there will be a diminution in pipeline stocks of all metals, and an increase in the refined stocks of platinum during the current year.

Additions to stocks and stores over the past two years have absorbed approximately £1.2M., a figure which can incidentally be compared with the carry-forward of expenditure on capital assets amounting to £1.7M. The necessity to finance this considerable increase in pipeline stocks, together with the necessity to finance further increases anticipated during the current year, at a time when

metal prices have fallen and the level of sales has materially decreased, places a considerable strain upon the resources of your company. Taking into account all relevant factors, it is clear that under present conditions the dividend for the current year will be sharply reduced. In view of the uncertainty of the position and the necessity to assess the results for the year as a whole before deciding upon the correct appropriations to be made from current profits, the Board regrets that it is inadvisable to make an interim dividend payment in February, 1958.

As regards the future profitability of your company, I have referred to some factors which have brought about the recent fall in demand for platinum and I think it will be appreciated from the nature of these factors and the speed at which the situation has changed during the past six months how difficult it is to attempt to forecast future levels of supply and demand, a difficulty which is enhanced by the present uncertain prospects for world industrial activity in 1958. When the present economic and technological uncertainties have been resolved, it may well prove to be the case that there will be a recovery in demand for platinum to levels appreciably higher than presently obtaining, but I am not prepared to hazard a guess as to the length of time before such a recovery might take place. In the short term this depends primarily upon the oil industry. In the long term it is, in my opinion, reasonable to assume that the gradual growth in demand for industries other than oil refiners which has continued over the past twenty years will continue in future years.

If it is possible to supply any further information or to make any better assessment of the position at the date of the Annual General Meeting on January 30, a further statement will be made at that meeting.

The following changes have taken place in the Directorate of the Company since the issue of the Directors' Report:

Mr. P. S. Hammond was appointed a Director of the Company with effect from January 1, 1958, in place of Mr. E. S. Hallett, resigned. The Board places on record its appreciation of the excellent services rendered by Mr. Hallett to the Company since his appointment as a Director in 1947.

Mr. W. M. Walker, who was Alternate Director to Mr. Hallett, has been appointed Alternate Director to Mr. Hammond.

D. A. B. WATSON,
Chairman.

Registered Office:
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Johannesburg.
January 22, 1958.

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News and Results—Continued.

Rio Tinto-Dow Chemical Rare-Earth Scheme.—The Rio Tinto Mining Co. of Canada and Dow Chemical of Canada have jointly formed a new company, Rio Tinto-Dow Ltd., whose initial purpose will be to concentrate on the production of thorium and rare earths from by-product materials of three uranium mining companies in the Blind River area of Canada, managed by the Rio Tinto Group.

Shareholders of the new company will be Dow Chemical of Canada and the Rio Tinto Mining Company of Canada, together with the mining companies concerned, namely Algom, Northspan, and Miliken Lake uranium mines.

Dow Canada, a wholly owned subsidiary of the Dow Chemical Co., are manufacturers of basic chemical, and Rio Tinto Canada is a subsidiary of the Rio Tinto Co.

Rio Tinto will be represented on the board of the new company by the Hon. Robert Winters, who will be president, Dr. Gillanders and Mr. R. Jeanty. Dow Canada will be represented by Mr. L. D. Smithers, Mr. J. L. Smart and Mr. H. D. Doan. Dr. J. D. Head of the Executive Research Department of the Dow Chemical Co. will be general manager.

Turner and Newall Earn More.—Consolidated net earnings of Turner and Newall in the year ended September 30, 1957, were £5,116,987 after tax, an improvement from £4,865,218 in 1956. The recommended final dividend of 12½ per cent on the present capital and an interim of 5 per cent on the old capital (equivalent to 2½ per cent on the new) compare with distributions last year equivalent to 13½ per cent on the new capital. Meeting, Manchester, January 21. Sir Walker Shepherd is chairman.

Mawchi Joint Agreement Signed.—The joint venture agreement between Mawchi Mines and the Burma Government was signed in Rangoon on December 26. At the company's meeting on December 31 the agreement was ratified, but rejection of the company's report and accounts necessitated an adjournment for one month.

Eileen Alannah.—Eileen Alannah announce that the new plant on their property in Rhodesia is complete, and running-in has been commenced.

MINING ENGINEERS

A large Mining Company operating in Upper Burma (climate sub-tropical and healthy) has vacancies for MINING ENGINEERS. ONLY APPLICATIONS FROM GRADUATES OF A RECOGNIZED SCHOOL OF MINES WILL BE CONSIDERED. Four years' agreement; six months' paid leave of which three months normally permitted after two years; contributory Provident Fund, free passage, partly furnished quarters and medical attention. Commencing salary and allowances aggregate K.1,425 (£106 17s. 6d.) per month rising to K.1,575 (£118 2s. 6d.) in fourth year. Prospects promotion to Engineer Foreman after six months with commensurate increase salary. Advise fullest details education, qualifications, experience, age and family status. Box A.403, Willing's, 362 Grays Inn Road, London, W.C.1.

APEX (TRINIDAD) OILFIELDS

The 38th annual general meeting of Apex (Trinidad) Oilfields, Ltd., was held on January 22 in London.

Mr. F. R. Cottell (the chairman) said that after provision for development and contingencies and depreciation of fixed assets, net oil revenue was £1,375,000. After providing £690,000 for taxation in Trinidad and the United Kingdom, the net profit for the year was £773,000. The directors recommended a final dividend of 1s. 6d. free of income tax per 5s. unit of stock, making a total dividend for the year of 2s. free of income tax per unit of stock.

The production for the year was 3,037,000 barrels of crude oil and 3,682,000 gallons of casinghead gasoline. During the year 131,322 feet were drilled. 19 wells were drilled in the main field, 5 in the synclinal area and 1 in the Cedros area of the south-west peninsula. The Cedros well was drilled with the deep diesel rig and was carried to a depth of 13,045 feet.

Increases in oil prices and in the company's production for the year were the main reasons for the excellent results which were achieved despite further additions to its expenses. Some recession in oil prices had, however, already taken place and if this were accentuated, particularly if accompanied by further substantial increases in costs, it might seriously hamper the company in its operations and in the search to extend the tested areas of the property.

The resolutions before the meeting were carried.

ASHANTI GOLDFIELDS CORPORATION LIMITED

Notice is hereby given that the Board of Directors have today recommended a Final Dividend (No. 122) on the Issued Capital of the Corporation at the rate of 10d. per Share, less Income Tax at 8s. 6d. in the £. This Dividend, which is in respect of the year ended September 30, 1957, to be payable on and after April 3, 1958, to all Shareholders on the Registers on February 13, 1958.

The TRANSFER BOOKS WILL BE CLOSED from February 14, 1958, to February 20, 1958, both dates inclusive, for the preparation of Dividend Lists.

By Order of the Board,

E. W. MORGAN, Secretary.

Registered Address:
10 Old Jewry, London, E.C.2.
January 21, 1958.

BIBIANI (1927) LIMITED

Notice is hereby given that the Board of Directors have today recommended a Final Dividend (No. 38) on the Issued Capital of the Company at the rate of 2.4d. per Unit of Stock, less Income Tax at 8s. 6d. in the £. This Dividend, which is in respect of the year ended September 30, 1957, to be payable on and after April 3, 1958, to all Stockholders on the Registers on February 13, 1958.

The TRANSFER BOOKS WILL BE CLOSED from February 14, 1958, to February 20, 1958, both dates inclusive, for the preparation of Dividend Lists.

By Order of the Board,

E. W. MORGAN, Secretary.

Registered Address:
10 Old Jewry, London, E.C.2.
January 21, 1958.

WIGAN AND DISTRICT MINING AND TECHNICAL COLLEGE

Applications are invited for a post as LECTURER IN THE DEPARTMENT OF MINING AND GEOLOGY. Duties commence on May 1, 1958.

Candidates should possess a degree or a recognized qualification in Mining, Surveying, Colliery Mechanical or Colliery Electrical Engineering. Salary £1,200 by £30

to £1,350 with additions for qualifications and experience.

Further particulars and application form will be sent by the undersigned. Last date for receipt of applications: Tuesday, February 4, 1958.

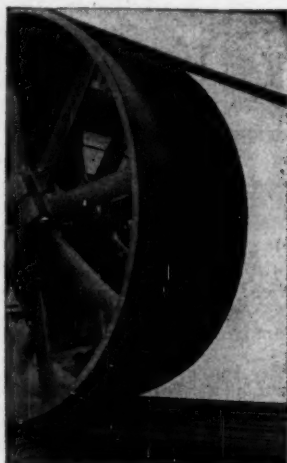
E. C. SMITH,
Principal.

January 16, 1958.

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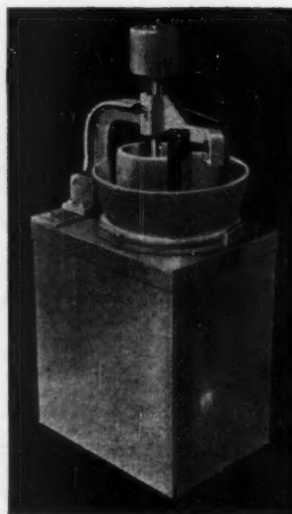
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*This feature appears every fourth week***BURMA MINES LIMITED**

The following summarises the Operating results of BURMA CORPORATION (1951) LIMITED (Incorporated in the Union of Burma and jointly owned by Burma Mines Limited and the Union Government) for the THREE months ended 30th September, 1957.

ORE EXTRACTION

29,862 tons.

PRODUCTION

| Concentrating Ore Milled (dry tons) | Ozs. Silver | % Lead | % Zinc |
|--|-------------|--------|--------|
| 28,370 | 13.29 | 16.46 | 11.46 |

Marketable Products were as follows:—

| Refined Lead Tons | Refined Antimonial Lead Tons | Refined and Doré Silver Fine Ozs. | Copper Matte Tons | Nickel Speiss Tons | Zinc Concentrates 34%-58% Zn. Dry Tons |
|-------------------------|------------------------------------|---|-------------------------|--------------------------|--|
| 3,000 | 99 | 266,974 | 90 | 129 | 4,196 |

ESTIMATED REVENUE AND EXPENDITURE

| | | |
|---|--------------|----------|
| Gross Revenue (after adjustment of value of metal stocks) | K. 63,35,700 | £475,177 |
| Operating Expenditure | K. 63,53,900 | £476,542 |
| Operating Loss | K. 18,200 | £ 1,365 |
| Estimated Taxation | Nil | Nil |
| Estimated Depreciation on Machinery and Plant, etc. | K. 2,45,500 | £ 18,412 |
| Capital Expenditure | K. 4,23,800 | £ 31,785 |

Sales of most products were less in volume than in the previous Quarter and the proceeds thereof, as also the valuation of stocks on hand at the end of the Quarter, were adversely affected by the further decline in metal prices.

Expenditure was lower by reason of decreased operating expenses and realisation charges.

After allowing for the foregoing estimated Depreciation the estimated Net Loss for the Quarter is K. 2,63,700 (£19,777) which compares with a Net Profit of K. 25,000 (£1,875) for the previous Quarter.

The Sterling figures shown are based on a Rate of Exchange of 1/6d. per Kyat.

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| Aluminium, 99.5%, £197 per ton | Iridium, £25/£28 10s. oz. nom. |
| Antimony— | Lanthanum (98/99%) 15s. per gram. |
| English (99%) delivered, 10 cwt. and over £190 | Manganese Metal (96%-98%) £310 |
| per ton | Magnesium, 2s. 5½d. lb. |
| Crude (70%) £190 per ton | Nickel, 99.5% (home trade) £600 per ton |
| Ore (60%) basis 19s. 6d./20s. 6d. nom. per unit, c.i.f. | Osmium, £25 oz. nom. |
| Arsenic, £400 per ton | Osmiridium, nom. |
| Bismuth (min. 1 ton lots) 16s. lb. nom. | Palladium, £7 10s. oz. |
| Cadmium 10s. 0d. lb. | Platinum U.K. and Empire Refined £28/10 oz. |
| Cerium (99% net), £13 18s. lb. delivered U.K. | Imported £26 5s./£26 15s. nom. |
| Chromium, Cr. 99% 7s. 2d. lb. | Quicksilver, £73 0s. ex-warehouse |
| Cobalt, 16s. lb. | Rhodium, £40/£42 oz. |
| Germanium, 99.99%, Ge. kilo lots 3s. 4d. per gram | Ruthenium, £15/£18 oz. nom. |
| Gold, 248s. 8½d. | Selenium, 53s. 6d. per lb. |
| | Silver, 77d. f. oz. spot and 76½d. f.d. |
| | Tellurium, 15s. 16s. lb. |

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| Chrome Ore— | 18/20% 1s. 3d. lb. c.i.f. |
| Rhodesian Metallurgical (semifriable) 48% | £17 5s. 0d. per ton c.i.f. |
| Hard Lumpy 45% | £18 0s. 0d. per ton c.i.f. |
| Refractory 40% | £12 5s. 0d. per ton c.i.f. |
| Smalls 44% | £16 5s. 0d. per ton c.i.f. |
| Baluchistan 48% | £12 0s. 0d. per ton f.o.b. nom. |
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| Fluorspar— | |
| Acid Grade, Flotated Material | £22 13s. 3d. per ton ex. works |
| Metallurgical (75/80% CaF ₂) | 156s. 0d. ex works |
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| Petalite min. 34% Li ₂ O | 47s. 6d./52s. 6d. per unit f.o.b. Beira |
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| Europe (46%-48%) basis 77s. 6d. freight | nom. |
| Manganese Ore (43%-45%) | nom. |
| Manganese Ore (38%-40%) | nom. (including duty) |
| Molybdenite (85% basis) | 8s. 5d. per lb. (f.o.b.) |
| Titanium Ore— | |
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| Ilmenite 52/54% TiO ₂ | £11 10s. per ton c.i.f. Malayan |
| Wolfram and Scheelite (65%) | 91s. 0d./97s. 0d. per unit c.i.f. |
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